

CITRUS HEIGHTS

# Greenhouse Gas Reduction Plan

Adopted by the City Council - August 11, 2011



Citrus Heights



# CITRUS HEIGHTS GREENHOUSE GAS REDUCTION PLAN

***Adopted by the City Council  
Resolution 2011-105  
August 11, 2011***

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# EXECUTIVE SUMMARY

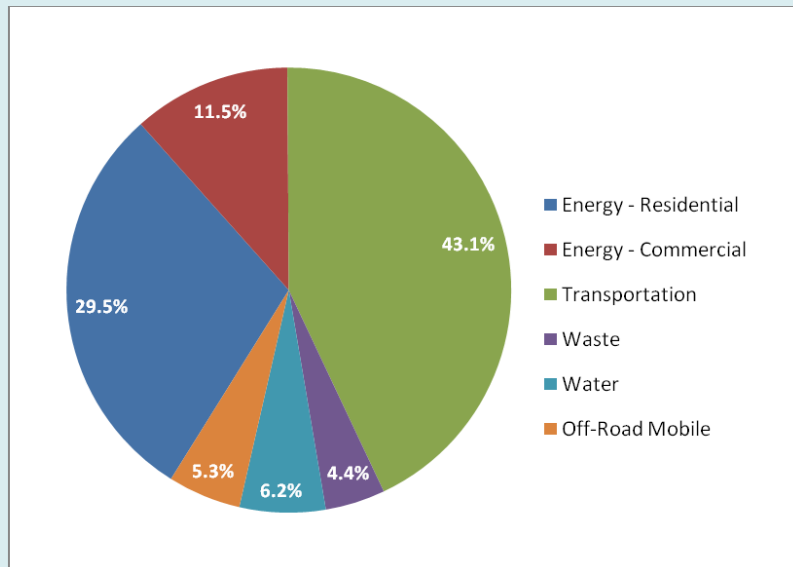
Our choices regarding how we travel, build, and operate within our community can all contribute to increased greenhouse gas (GHG) emissions. Emissions from various daily activities get trapped in our atmosphere, and in return, trap heat on the planet. A human activity-enhanced greenhouse effect is generally accepted to be one of the primary causes of global climate change.

The City of Citrus Heights Greenhouse Gas Reduction Plan (GGRP) addresses major sources of GHG emissions in the community that cumulatively contribute to global climate change. The City's approach to addressing GHG emission reductions includes:

- completing a baseline GHG emissions inventory and projecting future emissions;
- identifying a communitywide GHG reduction target;
- preparing a GHG reduction plan to identify strategies and measures to meet the reduction target;
- identifying targets and reduction strategies in the General Plan and evaluating the environmental impacts of the GGRP in the General Plan EIR; and
- monitoring effectiveness of reduction measures and adapting the plan to changing conditions.



In 2008, the City of Citrus Heights joined other Sacramento County communities in preparing a GHG emissions inventory. Following certain adjustments that better characterized Citrus Heights' local conditions and jurisdiction, the baseline inventory indicated that the community released 543,727 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e) emissions in 2005. The communitywide baseline inventory reported emissions under different source-sectors, including transportation, off-road mobile sources (e.g., lawnmowers, boats), residential and commercial energy use, solid waste disposal, water use, and wastewater treatment. Below is the percent breakdown of emissions related to the various sectors:



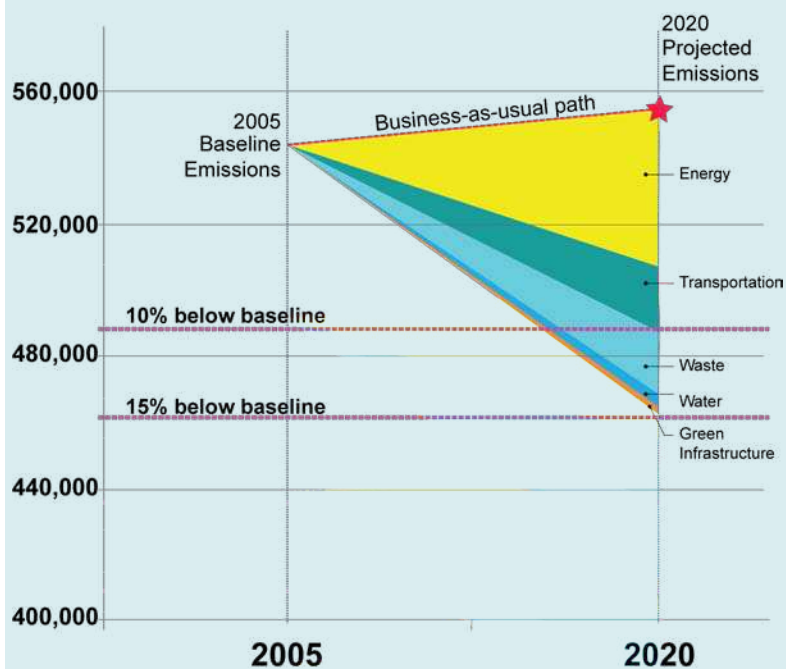
Under a business-as-usual scenario, communitywide GHG emissions would increase by approximately 2.3% between 2005 and 2020 to accommodate the General Plan's 2020 population of 92,949. If the City and community residents and businesses continue to operate in the same way as today, the communitywide emissions would be 556,396 MT CO<sub>2</sub>e by 2020.

On February 17, 2010, the Citrus Heights City Council recommended a communitywide reduction target of 10% to 15% below 2005 baseline emission levels by 2020. The Citrus Heights GGRP recommends communitywide strategies and measures that can collectively reduce GHG emissions approximately 87,267 MT CO<sub>2</sub>e emissions per year (equivalent to a 13.7% reduction below 2005 levels) and achieve the City's adopted emission reduction target.

City government recognizes its role and leadership potential in efforts to reduce the community's carbon footprint. The City has already taken a number of steps to reduce GHG emissions since the 2005 baseline inventory – such as synchronization of traffic signals, installation of LED street lights, and design and construction of a high-quality, energy and water efficient Community Center. However, City actions alone cannot achieve Citrus Heights' adopted emission reduction target. Community involvement and participation are essential to successful implementation of the GGRP. Ultimately, an individual's everyday actions will guide the larger effort of community-wide GHG emissions reduction.



Statewide reductions from implementation of Assembly Bill (AB) 1493, Low Carbon Fuel Standards (LCFS) and the Renewable Energy Portfolio Standard (RPS) were also considered during the development of the GHG emission reduction target and GGRP measures. Together with the effects of AB 1493, LCFS and the RPS in Citrus Heights, the recommended measures in the GGRP would enable a combined reduction of 145,677 MT CO<sub>2</sub>e/year, or about 24.5% below 2005 levels. While statewide reductions alone are nearly sufficient to achieve the City's target, their effects are not certain, and implementing them is an action beyond the City's control. The City accepts that it has a fair share responsibility to implement GHG reduction measures addressing communitywide emissions within its control, above and beyond statewide reductions. Thus, the recommended GGRP measures outline a path to achieving the GHG reduction target without relying on statewide reductions.



GHG reduction measures in this plan are grouped within seven strategy areas – community leadership and engagement, land use and community design, transportation and connectivity, energy efficiency and conservation, water efficiency and conservation, waste reduction, green infrastructure, and public health and safety. The GHG reduction measures were developed by (a) evaluating existing community conditions, (b) identifying emissions reduction opportunities within the City, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating state and regional laws, guidelines, and recommendations. The recommended GGRP measures are grounded in actions directly influenced by the City and rely on community participation. After considering a wide range of potential measures, recommended measures were selected based on the following criteria:

- What is the implementation cost to the City along with private costs and savings?
- Is it technically possible to implement the measure?
- Would the community support and adopt the measure?



- Does the measure create any additional community benefits (e.g., quality of life, jobs, improved health) beyond reducing GHG emissions?

The GGRP includes two types of measures: *primary* and *supporting* measures. *Primary* measures generate directly attributable GHG reductions based on current technology, empirical studies and available data. The GGRP recommends 19 *primary* measures that collectively meet the City's target of 10 to 15% below 2005 levels. A number of *supporting* measures have also been included. These measures are not quantifiable at this time, but they facilitate and support the reduction potential of the *primary* measures. Below is the estimated reduction potential of the recommended *primary* measures in the plan:

- Transportation and Connectivity** – 19,760 MT CO<sub>2</sub>e/year  
(6 primary measures)
- Energy Efficiency and Conservation** – 43,857 MT CO<sub>2</sub>e/year  
(10 primary measures)
- Water Efficiency and Conservation** – 4,030 MT CO<sub>2</sub>e/year  
(1 primary measure)
- Waste Reduction** – 18,880 MT CO<sub>2</sub>e/year  
(1 primary measure)
- Green infrastructure, Public Health and Safety** – 740 MT CO<sub>2</sub>e/year  
(1 primary measure)

In addition to reducing GHG emissions in Citrus Heights, the strategies described in this plan will also result in other community benefits, such as:

- Improved Air Quality** – Cutting GHG emissions can reduce air pollution. Less pollution allows for cleaner air and healthier families.
- Increased Energy Independence** – Reducing GHG emissions related to energy produced from non-renewable sources can reduce our reliance on imported and expensive fossil fuels.
- Creating Healthier Neighborhoods** – By designing complete streets that connect neighborhoods to commercial areas and public spaces, the City can support alternative transportation modes such as walking and biking – both of which can have positive effects on community health by promoting outdoor activities and exercise.
- Creating Local Jobs** – Many strategies recommended in this plan can stimulate new jobs in the community, along with vocational training for energy efficiency retrofits, installing and maintaining renewable energy technologies, and installing water-conserving landscaping.
- Saving Money** – Importantly, using less energy and water can translate into utility bill savings for residents and businesses.



The City of Citrus Heights GGRP represents the City's best attempt at responding to the need to reduce GHG emissions through municipal operations and community activities. Federal and State policies and requirements regarding climate change are continually evolving to meet the challenges and effects of a rapidly changing climate. Over the next decade, new GHG reduction technology and ways to measure GHGs are also likely to develop. To remain effective, the GGRP will be updated periodically (approximately every 3 years). During these updates the City may also investigate new measures that have not been recommended currently due to financial or technical constraints to determine their future applicability.

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## CHAPTER

# 1

# INTRODUCTION

## OUR VISION

### City Council Statement

We are pleased to introduce the Citrus Heights Greenhouse Gas Reduction Plan (GGRP). City government can provide leadership in efforts to reduce our community's carbon footprint. Recognizing this in 2008, the City of Citrus Heights joined other Sacramento County communities in preparing a greenhouse gas (GHG) emissions inventory. The City has completed a baseline emissions inventory, which indicated that the Citrus Heights community released 543,727 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e) in 2005. In 2010, the City Council adopted a target to reduce community-wide greenhouse gas emissions by 10% to 15% below 2005 levels by 2020.

At recent meetings and workshops, Citrus Heights residents and businesses have made it clear that climate change and the impact it will have on the quality of life of future generations is an important issue. Many of you have contributed your thoughts and ideas concerning steps that can reduce GHG emissions while also promoting a healthy lifestyle, improving air quality, restoring habitat, making neighborhoods more walkable and creating local jobs. This valuable input from the community has informed the GGRP so that it is unique to our City and describes our common interests.

With the guidance provided within this plan, City government and Citrus Heights community members can, together, make meaningful changes in our everyday lives and operations to reduce our carbon footprint. We look forward to working together toward a more sustainable future for Citrus Heights and for all of us!

### Public Input

Citrus Heights residents have actively participated in the development of the GGRP. From the early stages of the planning process, City leaders have recognized the pivotal role of public engagement and input in the plan. A variety of outreach methods were used to make the contents of the plan available to all interested parties. Citrus Heights residents and businesses were involved in various ways through the City's General Plan Update website, E-notifiers to mailing list members, three community outreach meetings (November 2009, January and June 2010), Planning Commission study sessions (January and June 2010), and City Council study sessions (February and June 2010), and through social networking websites (such as Facebook). All meeting agendas, minutes, and draft GHG reduction measures were published online to allow easy access, review and participation by the community. Comments received at public meetings and study sessions have been considered and included within the GGRP and General Plan environmental review process.

It became evident through the public workshops that residents and businesses in Citrus Heights preferred approaches to educate residents and businesses to “do the right things” regarding energy and water conservation, solid waste reduction, and alternative transportation modes, as opposed to additional regulation. Conducting regular workshops to promote sustainable life choices will help the community make better decisions to reduce its contribution to the greenhouse effect. As a result, the recommended GHG reduction measures within the plan are directly related to the success of a strong public outreach and education program within the community.

*“California has set ambitious goals (AB 32) to address climate change and reduce greenhouse gas emissions. Because of the diversity of California's topography and different local climates, the effects of a changing climate on California communities are complex and will differ from community to community. And, because California communities themselves are different, reducing greenhouse gas emissions will also vary from community to community, as will adapting to climate change.”*

Source: *How to Harness the Power of Your Community to Address Climate Change, California Air Resources Board and Institute for Local Government*

## Purpose

The City of Citrus Heights GGRP addresses major sources of GHG emissions in the community that cumulatively contribute to global climate change. The GGRP performs three primary functions:

- outlines various strategies and measurable implementation actions to meet the City's General Plan goal of reducing GHG emissions by 10% to 15% below 2005 levels by 2020,
- inspires residents and businesses to participate in community efforts to reduce GHG emissions,
- demonstrates Citrus Heights' ability to respond to and comply with California's GHG reduction legislation and regulatory guidance, and
- improves overall quality of life in the community by promoting smart growth and mobility principles that better connect the community, reduce air pollution and urban heat island effects, and encourage healthy lifestyles.

## Scope

This plan includes strategies and performance indicators to reduce GHG emissions from both municipal and communitywide activities within the City. The strategies address seven major GHG emission sources in Citrus Heights and set forth actions to achieve GHG reductions through community engagement and leadership, land use and community design, transportation choices, energy and water conservation techniques, solid waste reduction and building green infrastructure.



## Acronyms Used in this Document

AB	Assembly Bill
ARB	California Air Resources Board
BERC	Business Environmental Resource Center
BRT	Bus Rapid Transit
CEC	California Energy Commission
CFL	Compact Fluorescent Light
CH <sub>4</sub>	Methane
CHWD	Citrus Heights Water District
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide equivalent
EPA	U.S. Environmental Protection Agency
EO	Executive Order
GBC	California Green Building Code
GHG	Greenhouse gas
GGRP	Greenhouse Gas Reduction Plan
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
HVAC	Heating, ventilating, and air conditioning
ICLEI	International Council of Local Environmental Initiatives, renamed to "ICLEI – Local Governments for Sustainability"
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation System
LCFS	Low Carbon Fuel Standard
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
LID	Low impact development
MT	Metric tons
PG&E	Pacific Gas and Electric
RT	Sacramento Regional Transit
RPS	Renewable Portfolio Standard
SACOG	Sacramento Area Council of Governments
SB	Senate Bill
SJUSD	San Juan Unified School District
SMUD	Sacramento Municipal Utility District
SSB	Sacramento area Sustainable Business
TDM	Transportation demand management
USGBC	U.S. Green Building Council
VMT	Vehicles miles traveled
WSUD	Water Sensitive Urban Design

## Organization

The GGRP is organized into the following chapters:

**Introduction** – discusses opportunities and challenges in view of increased GHG effects at a global, regional and local level and related legislation and policy. This chapter also describes City actions underway to reduce GHG emissions and how actions by individual community members can strengthen the community-wide power to combat climate change.

**The Planning Process** – provides an overview of the planning process to achieve the GHG reduction target of 10% to 15% below 2005 levels by 2020. This chapter summarizes the concept of GHG emission sectors, the City's baseline GHG inventory and projections for 2020, and the process of selecting an emission reduction target. Finally, this chapter explains how each emission reduction measure has been selected on the basis of its GHG reduction potential, financial effectiveness and community acceptability, and includes a graphic Layout Guide for the recommended measures.

**GHG Reduction Measures** – organizes the recommended GHG reduction measures within seven strategy areas. Each measure includes an implementation table, identifying responsible parties for action and performance indicators to track progress.

**Conclusion** – compares the recommended emission reduction measures to the adopted reduction target for 2020. The chapter also includes performance indicators for each primary GHG reduction measure to allow the City to monitor implementation of the plan.

## Challenges and Opportunities

### What is the Greenhouse Effect?

The greenhouse effect is a natural process. Without naturally occurring GHGs in the atmosphere – such as water vapor, carbon dioxide, nitrous oxide and methane, our planet's surface temperature would be rather cold and unpleasant. However, increased concentrations of GHGs in the atmosphere can also cause dangerous global warming and climate change consequences by magnifying the greenhouse effect, trapping excessive solar heat.

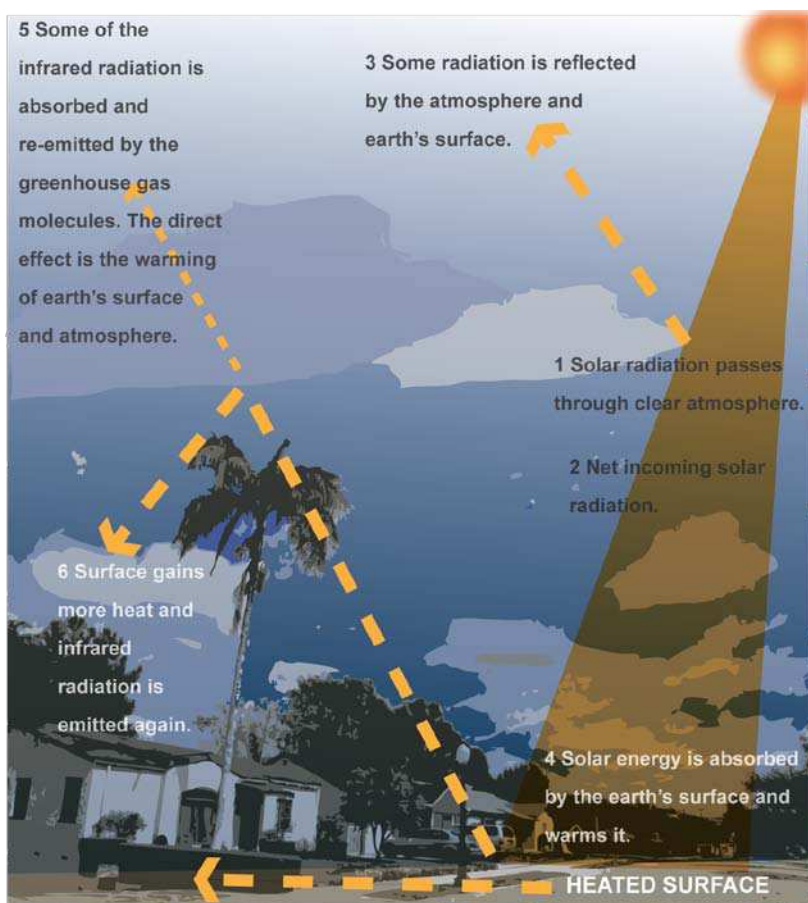
Although GHG concentrations have fluctuated with the natural cycle of ice ages, since the beginning of the industrial era concentrations of these gases have risen substantially. The main sources of GHG emissions, particularly carbon dioxide, methane and nitrous oxide, are the combustion of large amounts of fossil fuel used to produce energy and transport people and goods, deforestation and intensive farming methods.

When this plan refers to the greenhouse effect, it refers to the enhanced greenhouse effect caused by increasing GHGs resulting from human activity.

*"We basically have three choices: mitigation, adaptation, and suffering. We're going to do some of each. The question is what the mix is going to be. The more mitigation we do, the less adaptation will be required and the less suffering there will be."*

**John Holdren**

President of the American Association for the Advancement of Science; Harvard University



## State Legislation

### WHAT IS THE DIFFERENCE BETWEEN THE GREENHOUSE EFFECT, GLOBAL WARMING AND CLIMATE CHANGE?

These terms are often used to describe the same problem, but actually relate to cause and effect, or problem and consequence. The greenhouse effect is the cause and global warming and climate change are the consequences.

The greenhouse effect causes an accumulation of heat (or energy) in the atmosphere. The global climate must then adjust to deal with that extra accumulation of energy, and these adjustments result in global warming and climate change.

*Global warming results from an increase in the temperature of the Earth's lower atmosphere. Climate change results from alterations to regional climatic events such as rainfall patterns, evaporation and cloud formation.*

In 2005, Executive Order S-3-05 proclaimed that California is vulnerable to the effects of climate change. To combat those concerns, the Executive Order established a long-range GHG reduction target of 80% below 1990 levels by 2050.

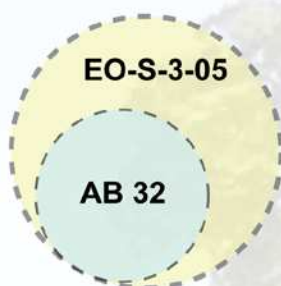
Subsequently, Assembly Bill (AB) 32, the *California Global Warming Solutions Act of 2006* was signed. AB 32 requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directed the California Air Resources Board (ARB) to develop and implement regulations that reduce statewide GHG emissions.

The *Climate Change Scoping Plan* (Scoping Plan) approved by ARB in December 2008, outlines the State's plan to achieve the GHG reductions required in AB 32. Though the Scoping Plan does not define the specific role local governments will play in meeting the State's GHG reduction goals, it identifies cities and counties as "essential partners" within the overall statewide effort.

Additionally, Senate Bill (SB) 375 (2008) established a process whereby regional targets for reduced VMT and GHG emissions will be established by ARB, in collaboration with Metropolitan Planning Organizations (MPOs) throughout the state, including the Sacramento Area Council of Governments (SACOG). Once determined, these targets will apply to the transportation emissions sector.

## Legislative Framework at a Glance

### Primary



#### Significance of 15% below baseline

Scoping Plan identifies 15% below current emissions levels as a fair proportion of reductions by local jurisdictions to meet the State-wide target

**Executive Order S-3-05:** Establishes a long-range GHG reduction target of 80% below 1990 levels by 2050.

**Assembly Bill 32:** Requires California to reduce statewide GHG emissions to 1990 levels by 2020.

**Climate Change Scoping Plan:** Outlines the State's plan to achieve the GHG reductions required in AB 32. No specific emission reduction target is established for local jurisdictions, but recognizes cities and counties as "essential partners" within the overall statewide effort.

### Supporting

**SB 97:** Requires climate change analysis in CEQA review.

**SB 375:** Connects land use choices to vehicle miles traveled.

**SB 1078:** Mandates percentage of electricity from renewable sources for energy providers.

**SB 7:** Requires the State achieve 10% and 20% reductions in urban per capita water use by 2015 and 2020 respectively.

**AB 811:** Enables public financing for energy efficiency improvements and renewable energy production.

# Moving Forward

## City Actions

The City of Citrus Heights has already taken various actions to reduce GHG emissions since the 2005 baseline inventory. Some of the City actions that are making a difference in creating a sustainable future include the following:

- High-quality design that results in energy and water efficiency in the new Community Center
- 4.6 miles of City streets now have synchronized traffic signals, reducing emissions caused by idling cars
- 6 miles of rubberized asphalt on City streets, providing noise attenuation and using recycled materials
- 16 traffic signals have been converted to light emitting diodes (LEDs) as part of an ongoing conversion of City street lights to LED
- Installation of photovoltaic systems on City Hall and the Community Center
- Installation of LED street lights on Antelope Road
- Reduction of speed limits on some streets to promote walking and biking
- Ongoing increased recycling efforts

*The projected effects of climate change will vary geographically. Projected effects within the Sacramento region include:*

1. *Variable Precipitation - Reduced Sierra snowpack, earlier snow melt, higher stream and river flows, intense storms each season, or extended drought periods punctuated by intense precipitation events.*
2. *Heat Waves - More frequent, longer, and more-extreme heat waves and associated health effects.*
3. *Wildfires - Increased wildfire risk and associated air quality and health problems.*
4. *Air Quality - Increased production of smog. The higher the temperature, the more rapid is the production of air pollutants, especially in the ozone layer.*
5. *Water Supply - Decreased water supply with implications for agriculture and community residents.*
6. *Flooding - Greater risks of flooding due to more extreme storm events and levee stress from rising sea levels.*
7. *Water Quality - Potential water quality problems associated with sea level rise (e.g., increased salinity in receiving waters) and higher river and stream flows.*
8. *Agriculture - Decreased production from livestock and crops sensitive to temperature increases and decreased water supply and increase in various pests.*

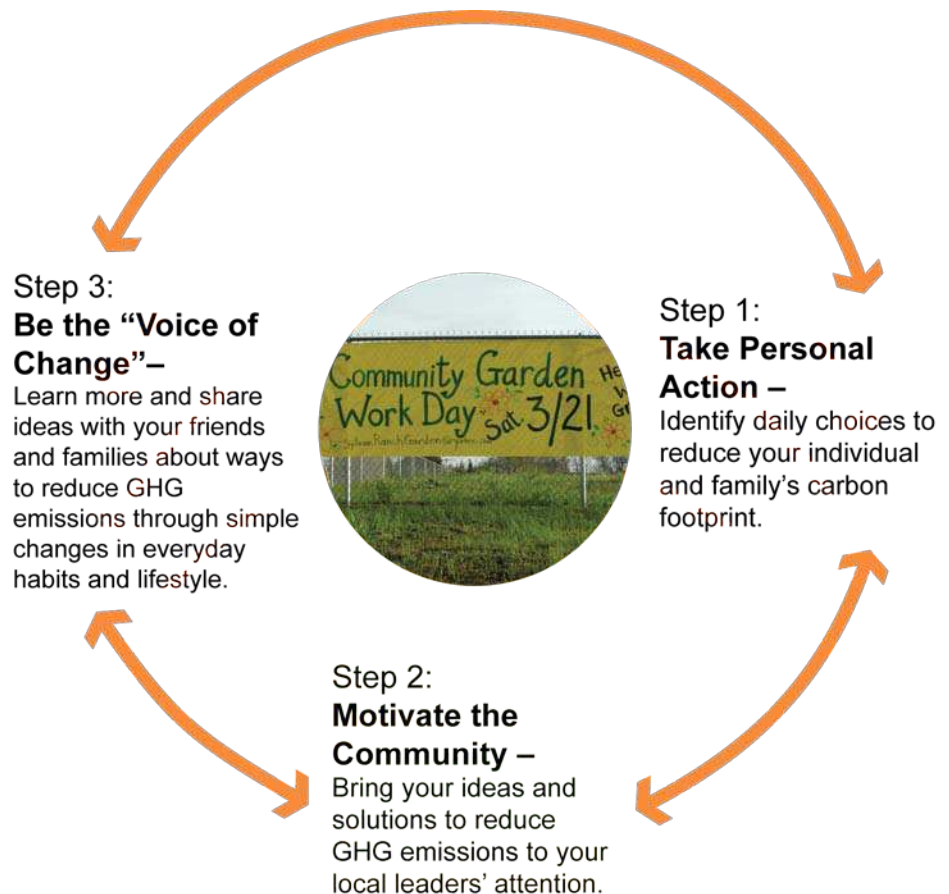
*Source: Sacramento County Climate Action Plan Phase 1 (Draft published May 2009)*



## Individual Actions

City actions alone cannot achieve Citrus Heights' adopted emission reduction target. Community involvement will be critical to successful implementation of the GGRP. Ultimately, an individual's everyday actions will guide the larger effort of community-wide GHG emissions reduction. As members of the Citrus Heights community, each step taken by an individual resident or business owner will be part of the solution.

As an individual, affecting a large-scale change in a global process may seem daunting, but breaking it down into a three-step process (as shown below) illustrates the cumulative significance of many smaller individual actions. In other words, if each individual can make a number of small changes in their everyday habits it will collectively make a big difference.





Ten Simple Ways to Make a Difference:

1		<b>Drive Smart</b> - Smart, smooth and safe driving techniques lead to average fuel savings of 5-10%. Switching off your engines if you have to stop for more than a minute saves fuel and reduces emissions. Check tire pressure at least once every two weeks to ensure adequate inflation and save money on fuel.
2		<b>Drive Less</b> - Bike, take public transit or walk for short daily trips. Leaving your car home twice a week can save fuel and reduce related emissions. Also, if you need to take your car, plan ahead to combine errands, instead of making multiple trips.
3		<b>Dress for the Weather</b> - Set your central thermostat at 68 degrees (65 at night) during winter days and at 78 degrees during summer. When indoors, dress warmly during winter months instead of turning up the heat and dress lightly in summer instead of turning up air conditioning. Use a fan to optimize air circulation.
4		<b>Use Energy Wisely</b> - Turn off lights and unplug appliances when not in use. Many appliances continue to draw a small amount of power when they are switched off. These "phantom" loads occur in most appliances that use electricity, such as VCRs, televisions, stereos, computers, and kitchen appliances.
5		<b>Save Water</b> - A leaky toilet can waste almost 200 gallons of water per day. Check for leaks regularly and fix them to save on water bills. Taking shorter showers and using less hot water saves both water and energy required for heating it. Wash only when you have a full load of clothes and dishes.
6		<b>Plant Climate Appropriately</b> - Plant a tree but choose climate appropriately, so that it uses less water and maintenance. Climate appropriate gardens also attract local birds and critters. Learn to create rainwater gardens to infiltrate stormwater and reduce potable water demand. Set irrigation controls to seasonal water needs.
7		<b>Reduce and Reuse Before Recycling</b> - Look for creative ways to reduce trash and reuse an item before simply tossing it off to the recycle bin. For example, use reusable mugs at coffee shops and reusable water bottles during travel to reduce the use of disposable and single-use items such as plastic bottles.
8		<b>Create Your Own Reusable Shopping Bag</b> - Reusing just one bag in your daily life (grocery/home shopping, trips to the beach/pool, gym, picnics, festivals, travel, etc.) can "eliminate" the use of approximately six plastic bags every week. Creating your own reusable bag can maintain your personal style and be durable for many uses.
9		<b>Buy and Eat Locally</b> - Buying locally helps to reduce emissions related to transportation of the goods (including food) from distant places. Locally grown healthy food helps to maintain a seasonal variety of produce and recipes while saving fuel and cleaning the air from unnecessary transport-related emissions.
10		<b>Spread the Word</b> - Learn about ways to reduce your carbon footprint and share information about the economic and environmental benefits of simple lifestyle changes with your friends, neighbors and co-workers. Take opportunities to encourage community leaders to establish environment-friendly policies and programs.



## CHAPTER

# 2 THE PLANNING PROCESS

## STRATEGY

- The average carbon footprint for people in the United States is 20.4 metric tons
- The average for people in industrial nations is about 11 metric tons
- The average worldwide carbon footprint is about 4 metric tons
- The worldwide target to combat climate change is 2 metric tons

*Source: Nature Conservancy, Carbon Footprint Calculator*

The City of Citrus Heights is addressing the consequences of increased greenhouse gas (GHG) emissions related to both municipal and communitywide activities. In tandem with a focused update of the General Plan, the City will adopt a greenhouse gas reduction plan (GGRP) to reduce GHG emissions and meet the City's emission reduction target for 2020.

The City's approach to addressing GHG emission reductions within the General Plan is parallel to the climate change planning process being followed by more than 50 other California jurisdictions. This process includes:

- completing a baseline GHG emissions inventory and projecting future emissions;
- identifying a communitywide GHG reduction target;
- preparing a GHG reduction plan to identify strategies and measures to meet the reduction target;
- identifying targets and reduction strategies in the General Plan and evaluating the environmental impacts of the GGRP in the General Plan EIR; and
- monitoring effectiveness of reduction measures and adapting the plan to changing conditions.

### GHG Baseline Inventory

The purpose of a GHG baseline inventory is to identify and categorize the major sources of GHG emissions produced by community residents and businesses and municipal (City) operations.

A GHG emissions inventory was conducted for each incorporated city in Sacramento County, including the City of Citrus Heights, and the unincorporated area of Sacramento County (County) for the year 2005. In 2009, the Citrus Heights GHG emissions inventory was further refined to revise emission levels related to on-road mobile sources, off-road mobile sources, wastewater treatment, and high Global Warming Potential (GWP) gases to adjust for emissions directly attributable and influenced by the City.

The baseline inventory identified a communitywide emissions total of 543,727 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e) emissions<sup>1</sup>. The baseline includes both communitywide emissions (i.e., those emissions attributable to all sources in the community) and municipal emissions (i.e., those emissions directly attributable to City government operations).

Table 2-1 and Figure 2-1 show the communitywide GHG baseline for 2005.

#### What is a ton of carbon?

A ton of carbon is released when you:

- Travel 5,000 miles in an airplane, (e.g., a roundtrip between Sacramento and New York).
- Drive 2,500 miles in a medium-sized car, (e.g., driving one-way from Sacramento to New York.)
- Cut down and burn a tree that was about one foot in diameter and 40 feet tall

*Adapted from Nature Conservancy, Carbon Footprint Calculator*

#### What is a metric ton of carbon dioxide equivalent?

Carbon Dioxide Equivalency is a conversion method used to express the global warming potential (GWP) of multiple GHGs using a consistent unit of measurement, metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e). The measurement is expressed in terms of the amount of carbon dioxide (CO<sub>2</sub>) that would have the same GWP as the mixture. For example, methane is twenty-five times more potent than carbon dioxide, giving it a GWP of 25.

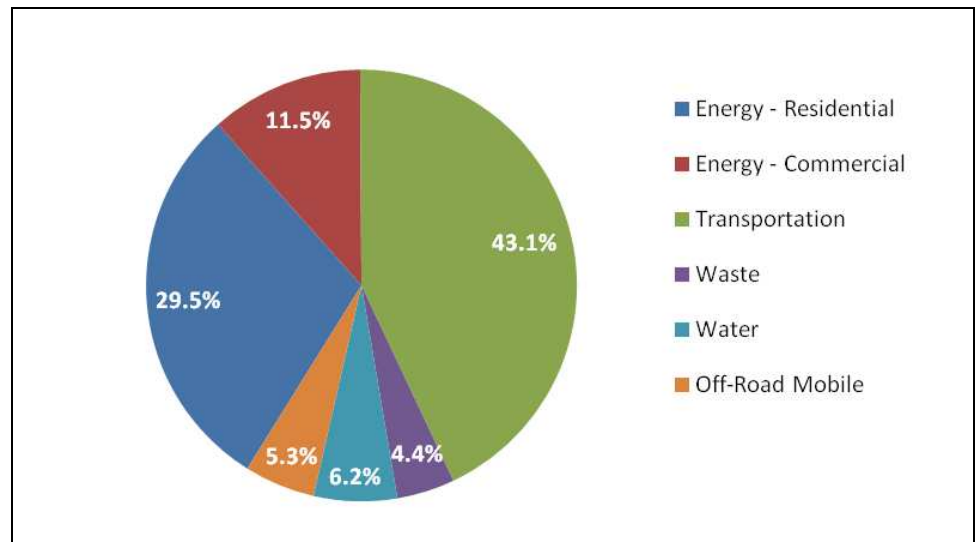
<sup>1</sup> The original emissions inventory identified a total of 578,134 MT CO<sub>2</sub>e within the Citrus Heights Community.

**Table 2-1:  
2005 Communitywide Greenhouse Gas Emissions Baseline**

Communitywide Emissions Sector	2005 Baseline Emissions	
	MT CO <sub>2</sub> e	Percent
Residential Energy Use	160,429	29.5%
Commercial Energy Use	62,553	11.5%
On-road Mobile sources (Transportation)	234,231	43.1%
Off-road Mobile sources	28,877	5.3%
Solid Waste	23,679	4.4%
Wastewater Treatment	30,433	5.6%
Water Use-related	3,525	0.6%
<b>Total</b>	<b>543,727</b>	<b>100%</b>
Notes: CO <sub>2</sub> e = carbon dioxide equivalent; MT= metric tons. Off-road mobile-source emissions are related to emissions from off-road motor vehicles such as boats, agricultural equipment, off-highway vehicles, lawn and garden equipment, and rail. Source: Data compiled by AECOM from the City of Citrus Heights Greenhouse Gas Emissions Inventory 2009.		

**2005 Communitywide  
Greenhouse Gas Emissions Baseline**

**Figure 2-1**



Note: Water and wastewater emissions are reported together within the water sector  
 Source: Sacramento County 2009, AECOM 2010.



## Chapter 2 - The Planning Process

Table 2-2 and Figure 2-2 show the municipal operations GHG baseline for 2007. The municipal inventory divides emissions among government buildings, streetlights and traffic signals, vehicle fleet, employee commutes, and methane emissions from waste generated by government operations and placed in landfills. GHG emissions from municipal operations are considered a subset of total communitywide emissions.

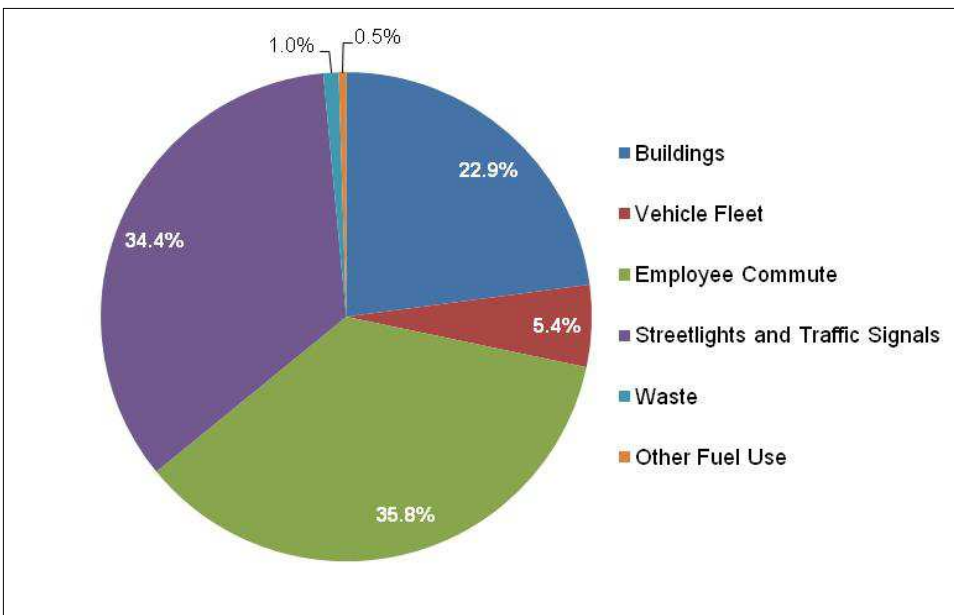
**Table 2-2**  
**2007 Municipal Greenhouse Gas Emissions**

Municipal Operations	MT CO <sub>2</sub> e	Percent
Buildings	603	22.9%
Vehicle Fleet	143	5.4%
Employee Commute	945	35.8%
Streetlights and Traffic Signals	908	34.4%
Waste	25	1.0%
Other Fuel Use	14	0.5%
<b>Total</b>	<b>2,638</b>	<b>100%</b>

Notes: CO<sub>2</sub>e = carbon dioxide equivalent; MT= metric tons.  
Source: Data compiled by AECOM from the City of Citrus Heights' Greenhouse Gas Emissions Inventory prepared by Sacramento County 2009.

**2007 Municipal**  
**Greenhouse Gas Emissions Baseline**

**Figure 2-2**



Source: Sacramento County 2009, AECOM 2010.

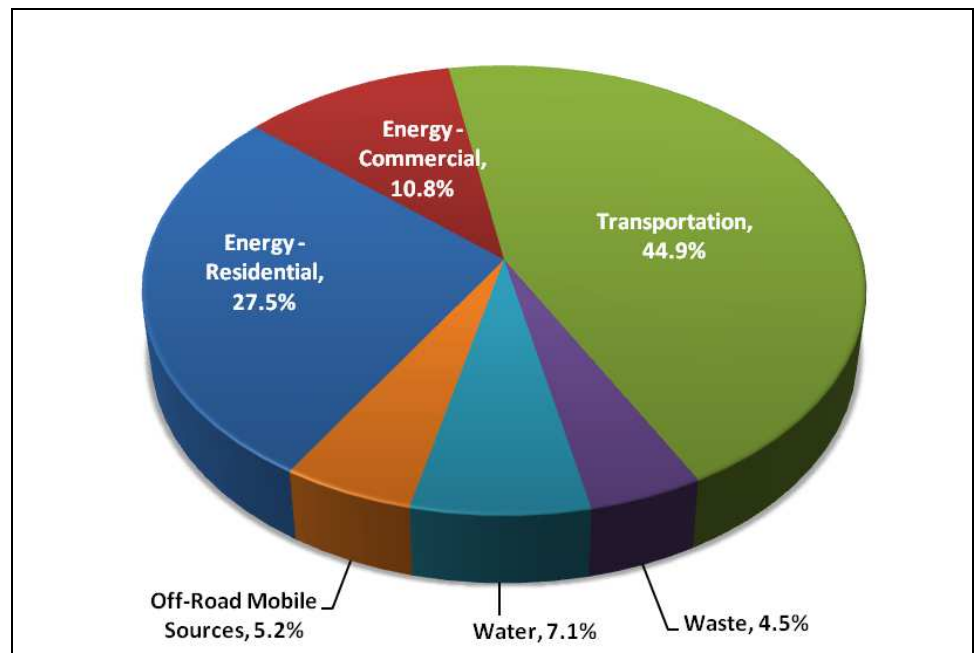
## Business-as-Usual GHG Projection Scenario

Under a forecasted business-as-usual scenario, the communitywide emission levels will increase by approximately 2% between 2005 and 2020. Therefore, by 2020 the communitywide emissions will be 556,396 MT CO<sub>2</sub>e to accommodate the General Plan's 2020 population of 92,949. Assuming that current practices continue, the community's GHG projection is made up of primarily transportation and energy-related emissions. GHG emissions from driving in the community and energy use in residential and commercial buildings add up to approximately 83% of the total projected emissions. The rest of the projected growth in GHG emissions comes from off-road mobile sources, waste, water and wastewater sectors.

Figure 2-3 illustrates the 2020 business-as-usual GHG projection for the various sectors identified in the community inventory.

2020 Business-as-usual GHG projections

Figure 2-3



Note: Water and wastewater emissions are reported together within the water sector  
Source: AECOM 2010.



## GHG Emission Reduction Target

Adopting an emission reduction target is an important step in assessing the effectiveness of the GGRP. In comparison to many other California jurisdictions, Citrus Heights is nearly built out, and a significant number of residents work in adjacent cities. However, approximately 60% of Citrus Heights' residential units and much of its commercial building stock were built prior to implementation of California's Title 24 Energy Efficiency Standards. Understanding this context, the City's baseline inventory, and business-as-usual projections led to establishment of a reduction target. On February 17, 2010, the Citrus Heights City Council recommended a communitywide reduction target of 10% to 15% below 2005 baseline emission levels by 2020.

Together, the adopted measures within the GGRP have the potential to reduce approximately 87,267 MT CO<sub>2</sub>e emissions per year (equivalent to a 13.7% reduction below 2005 levels) and achieve the City's adopted emission reduction target of 10% to 15% below 2005 baseline emissions level by 2020. Figure 2-4 demonstrates how the reduction potential of various strategies cumulatively helps to achieve the target.

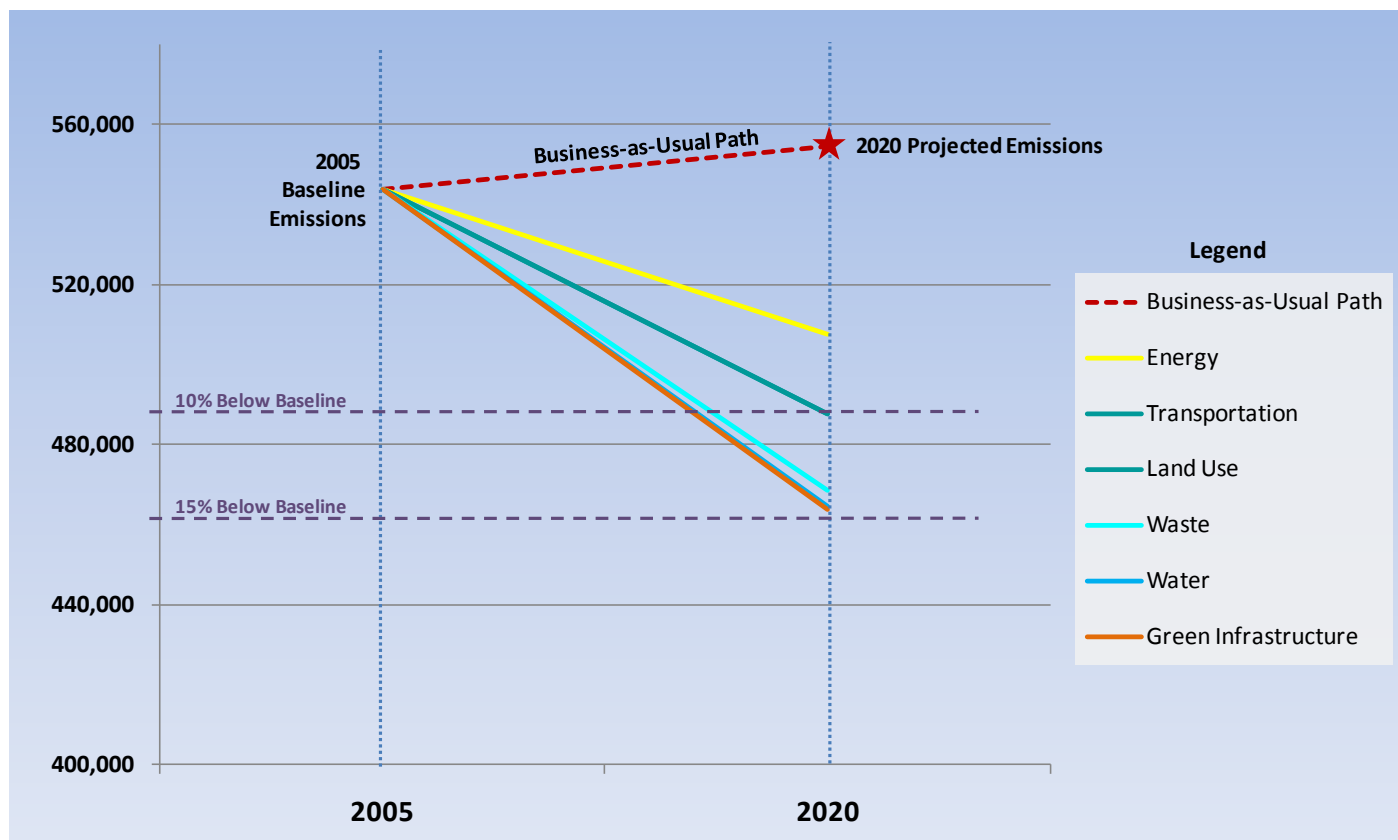
To attain a target of 10% to 15% below 2005 GHG emissions while accommodating projected growth through 2020, the Citrus Heights community needs to reduce total GHG emissions by 65,225 to 92,812 MT CO<sub>2</sub>e.

This is approximately equivalent to:

- Taking about 13,300 to 18,600 cars off the road for a year (assuming that an average car emits 11,000 lbs of carbon per year, and one pound of carbon is released every mile)

Greenhouse Gas Reduction Potential

Figure 2-4



## Statewide Greenhouse Gas Reductions

Statewide reductions from implementation of Assembly Bill 1493, Low Carbon Fuel Standards (LCFS) and the Renewable Energy Portfolio Standard (RPS) were also considered during the development of the GHG emission reduction target. The California Air Resources Board (ARB) estimates that implementation of GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles as described in AB 1493 will achieve a 15.76% increase in vehicle performance and therefore reduce the overall GHG emissions from on-road mobile sources by 2020 (Source: ARB Scoping Plan). This increase in statewide vehicle efficiency standards was considered while evaluating achievement of the GHG reduction target for the Citrus Heights community. Upgraded vehicle standards can effectively reduce GHG emissions in the transportation sector by 39,240 MT CO<sub>2</sub>e/year.

The City recognizes that statewide reductions will also occur from implementation of LCFS. Based on current available data, LCFS standards are projected to reduce overall statewide GHG emissions attributable to vehicle fuels by about 10%. Therefore, this increase in statewide vehicle-fuel efficiency can effectively reduce GHG emissions in the transportation sector by another 20,970 MT CO<sub>2</sub>e/ year.

Sacramento Metropolitan Utility District (SMUD) emission factors incorporate the mandated requirements of RPS, which require 33% of SMUD's electricity production to be from renewable sources. These factors were used to estimate the GHG emissions attributable to the energy sector within the 2020 projections, and to calculate the reduction potential of electric energy-related GGRP measures. Since these GHG reductions are already distributed within the 2020 energy projection and reduction measures, they have not been accounted for individually within statewide reductions to avoid double-counting.

The City's actions, together with the effects of AB 1493, LCFS and the RPS in Citrus Heights would enable a combined reduction of 145,677 MT CO<sub>2</sub>e/ year, or about 24.5% below 2005 levels. While statewide reductions alone are nearly sufficient to achieve the City's target, their effects are not certain, and implementing them is an action beyond the City's control. The City accepts that it has a fair share responsibility to implement GHG reduction measures addressing communitywide emissions within its control, above and beyond statewide reductions. Thus, the recommended GGRP measures outline a path to achieving the GHG reduction target without relying on statewide reductions.

## IMPLEMENTATION APPROACH

### Selecting Emission Reduction Strategies and Measures

Seven emission reduction strategies have been identified for the City of Citrus Heights GGRP. These are grounded in actions directly influenced by the City and reliant on community participation. Each strategy is then sub-divided into a series of recommended measures to reduce GHG emissions within the particular strategy.

The GHG reduction measures were developed by (a) evaluating existing community conditions, (b) identifying emissions reduction opportunities within the City, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating state and regional laws, guidelines, and recommendations. After considering a wide range of potential measures, recommended measures were selected based on the following criteria:

- What is the cost of implementation to City along with private costs and savings?
- Is it technically possible to implement the measure?
- Would the community support and adopt the measure?
- Does the measure create any additional community benefits (e.g., quality of life, jobs, improved health) beyond reducing GHG emissions?

### Implementation Flexibility

The City of Citrus Heights GGRP represents the City's best attempt at responding to the need to reduce GHG emissions through municipal operations and community activity. However, federal and State policies and requirements regarding climate change are continually evolving to meet the challenges of a rapidly changing climate and its effects. Over the next decade, new GHG reduction technology and ways to measure GHG reduction are also likely to develop. To remain effective, the GGRP must evolve accordingly. To ensure consistency and usefulness, the recommended measures should be considered within the City's annual budget process, and updated periodically to reflect newly available technologies and legal requirements.

To monitor successful implementation of the GGRP and track its progress toward the 2020 target, a new GHG inventory should be completed and the GGRP should be updated approximately every 3 years. During these updates the City may also investigate new measures that have not been recommended currently due to financial or technical constraints to determine their applicability in the future.

## Layout Guide

Figure 2-5 explains the layout that describes GGRP measures presented in Chapter 3. Each measure is described on a single page.

GHG Reduction Measures Layout

Figure 2-5

**STRATEGY HEADING:** Each strategy has its own color box for easy identification among the 7 strategy areas

Measure X-1.1: This is where the recommended measure will be described.

This is where the background for the recommended measure is described.

Each measure is accompanied by a table as shown below to determine the implementation approach for the specific measure.

**GHG Reduction Potential:**  
describes associated reduction in GHG (MTCO<sub>2</sub>e)

**Community Co-Benefits:**  
describes if the measure benefits any other strategy

**Cost to City**  
describes cost to the City in very low, low, medium or high range

**Cost to resident/business owner**  
describes cost to the building owner in very low, low, medium or high range

**Savings to resident/business owner**  
describes savings to the building owner in very low, low, medium and high range




  
  


Image caption.

**Did you know?**  
COOL TIP

Tips for actions, references related to specific measure

Actions	Implementation Target	Responsible Party

Notes and references

Related General Plan policies : Goal X.X, PolicyX.X, Policy X.X

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## CHAPTER

# 3

# GREENHOUSE GAS REDUCTION MEASURES

The greenhouse gas (GHG) reduction measures recommended within this plan are organized under seven major strategy areas, identified below:

1. **Community Engagement and Leadership** – these measures acknowledge the power of community participation and involvement, coupled with City leadership to reduce GHGs.
2. **Land Use and Community Design** – these measures respond to the limited scope for large-scale land use changes in Citrus Heights and identify opportunities to remove barriers to completing the streets and achieving smarter growth in the community.
3. **Transportation and Connectivity** – these measures build on General Plan policies to design and re-evaluate the City street network to more efficiently accommodate all modes, users and ability levels.
4. **Energy Efficiency and Conservation** – these measures promote ways to minimize non-renewable building and public space (such as outdoor lights) energy use and maximize use of renewable energy.
5. **Water Efficiency and Conservation** – these measures respond to the need to conserve water as a limited resource while promoting ways to minimize both wastewater generation and stormwater runoff in order to enhance water quality and the aquatic environment.
6. **Waste Reduction** – these measures identify ways to reduce waste and increase reuse, recycling and composting opportunities.
7. **Green Infrastructure, Public Health and Safety** – these measures promote ways to increase urban forestry and natural open space (including wetlands) within the community to enhance carbon sequestration and reduce urban heat island effects. Some measures within this strategy also promote expansion of urban agriculture and community gardening to increase local food security and recreational activity choices.



### Primary and Supporting Measures

The Greenhouse Gas Reduction Plan (GGRP) includes two types of measures: *primary* and *supporting* measures. *Primary* measures generate directly attributable GHG reductions based on current technology, empirical studies and available data. Estimated GHG reduction potential in metric tons carbon dioxide equivalent (MT CO<sub>2</sub>e) emissions per year is provided for each *primary* measure. The *primary* measures recommended within this plan outline a path to meeting the City's reduction target of 10% to 15% below 2005 baseline emissions by 2020. Collectively, these measures offer a potential reduction of approximately 87,267 MT CO<sub>2</sub>e/year by 2020 or 13.7% below 2005 emission levels.

A number of *supporting* measures have also been included in the GGRP. These measures are not quantifiable at this time, but they do facilitate and support the reduction potential of the *primary* measures. GHG reduction potential for these *supporting* measures were not estimated due to three reasons, (a) insufficient data exists to quantify their GHG reduction potential, (b) no reliable quantification methodology is currently available, and/or (c) the GHG reductions are not directly related to the emissions inventory and therefore, cannot be counted toward the City's 2020 GHG reduction target.

Figure 3-1 demonstrates the estimated reduction potential of the recommended *primary* measures within the various strategies.








### Community Co-Benefits

Beyond reducing GHG emissions, many of the GGRP measures have the potential to provide other important benefits to the community. These co-benefits represent an improvement in the quality of life within the community beyond the intent of the particular strategy area. Community co-benefits for each recommended measure are also identified on the individual measure pages. Some of the co-benefits of the GHG reduction measures described in this plan include:

- Supporting regional smart growth principles
- Improving air quality within the community
- Restoring habitat
- Reducing urban heat island effect
- Improving public spaces
- Improving public health
- Creating connected neighborhoods with complete streets
- Creating local jobs
- Increasing energy independence
- Enhancing community awareness and education
- Saving money

GHG Reduction Potential Per Strategy Area

Figure 3-1

LOGO	STRATEGY AREA	GHG REDUCTION POTENTIAL
	<b>Community Leadership and Engagement</b> To expand City's role as an environmental steward and lead the community by example. <i>*Note: This is not counted towards target. See discussion for Measure 1.1.F</i>	49,504* MT CO <sub>2</sub> e/ year
	<b>Land Use and Community Design</b> To reinforce a land use pattern that promotes healthy neighborhoods while maintaining the City's sense of community.	NA (reductions included in bike-ped transportation measures)
	<b>Transportation and Connectivity</b> To provide commuting and mobility options that promote healthy neighborhoods while maintaining the City's sense of community.	19,760 MT CO <sub>2</sub> e/ year
	<b>Energy Efficiency and Conservation</b> To minimize building and public realm energy consumption and transition to clean and renewable energy sources.	43,857 MT CO <sub>2</sub> e/ year
	<b>Water Efficiency and Conservation</b> To ensure that surface and groundwater quality supports public use, enjoyment and a healthy aquatic environment.	4,030 MT CO <sub>2</sub> e/ year
	<b>Waste Reduction</b> To create a communitywide strategy to reduce waste and encourage reuse and recycling.	18,880 MT CO <sub>2</sub> e/ year
	<b>Green Infrastructure, Public Health and Safety</b> To build greener infrastructure and promote healthy lifestyles.	740 MT CO <sub>2</sub> e/ year

## Cost/Savings Analysis

Cost and savings to the City, residents, and businesses are categorized as very low, low, medium, and high. Table 3-1 summarizes the category definitions.

**Table 3-1**  
**Cost and Savings Ranges**

<b>Cost to City Range</b>	<b>Private Cost/Savings Range</b>
Very low = < \$10,000	Very low = < \$100
Low = \$10k – \$50k	Low = \$100 – \$250
Medium = \$50k – \$100k	Medium = \$250 – \$500
High = > \$100,000	High = > \$500



# COMMUNITY LEADERSHIP AND ENGAGEMENT

The City of Citrus Heights and its residents and businesses have never shied away from the responsibility and leadership required to create a progressive community promoting diversity and a high quality of life. Local governments can greatly influence a community's GHG emissions. However, community engagement and effective participation is instrumental for the successful implementation of the GGRP.

During the GGRP implementation period, the City will conduct outreach programs that involve residents and businesses in various GHG-reducing activities, assessments and actions. Effective public participation will increase the likelihood that the GHG reduction measures recommended in this plan achieve estimated participation rates. Higher participation rates can be achieved if the outreach and education programs are adapted over time to meet the changing needs of the community.

The City also accepts responsibility for its share of GHG emissions and is committed to take necessary actions to reduce it. Some of the City's ongoing efforts to reduce municipal GHG emissions include completion of the highly-efficient Community Center, installing photovoltaic panels on the Community Center and City Hall, installing smart-signals along Greenback Lane to reduce emissions from idling cars, and converting City traffic signals and streetlights to light-emitting diodes (LEDs). Besides supporting and abiding by state regulations, the City will take immediate actions to reduce the carbon footprint of municipal operations. Specific measures related to municipal operations are distributed among the seven strategy areas. This section describes broader overarching measures to support regional, state and federal regulations and conduct effective public outreach programs.

## COMMUNITY LEADERSHIP AND ENGAGEMENT



Measure 1-1.A: Expand participation in the Sacramento area Sustainable Business program.

In partnership with the Business Environmental Resource Center (BERC), cities within Sacramento County have already been participating in the Sacramento area Sustainable Business (SSB) program. The SSB program certifies and promotes businesses that take voluntary action to prevent pollution and conserve resources. The program incorporates five aspects of sustainability: energy conservation, water conservation, pollution prevention, solid waste reduction and green building.

Of the 239 current members in the region, only the Shell Propel 85 station in Citrus Heights is part of the SSB program. To ensure increased participation and visibility of the program, the City will promote use of the Sustainable Business Resource Guide through outreach programs, website materials and workshops.

Increased participation in the free SSB certification program will afford businesses within the City access to technical resources and vendors that can help them reduce the carbon footprint of their business and achieve long term recurring savings. Recognition through the SSB program can also stimulate local businesses and improve employee attraction and retention.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Identify federal and state grant funding opportunities, peer networking*

### **Cost to City**

*Low*

*(staff expense)*

### **Cost to resident/business owner**

*NA*

### **Savings to resident/business owner**

*Medium – High*

*(recurring savings)*



Acknowledging local businesses with a reward program based on sustainability indicators can increase their business potential.

### **Did you know?**

#### **COOL FACT**

#### **SSB benefits:**

- Free assistance in making changes to your business
- Free advertising and promotion
- Cost savings through improved efficiency, energy and water conservation, and waste reduction
- Community recognition of your voluntary efforts to improve our environment
- Opportunity to gain recognition in the SSB quarterly newsletter and SSB annual awards ceremony.

Actions	Implementation Target	Responsible Party
A. Conduct an SSB outreach program in collaboration with BERC.	Before July 31, 2012	Community and Economic Development

#### Notes and References

*Fort Collins, Colorado has a similar program called Climate-wise. Since 2008, the 180 participating businesses in Fort Collins have reduced GHG emissions by over 100,000 tons of CO<sub>2</sub> per year. Despite a 5% growth in the City's population, communitywide emissions have not increased since 2005.*

Related General Plan policies: Policy 14.2, Policy 18.2, Policy 18.3



## COMMUNITY LEADERSHIP AND ENGAGEMENT



**Measure 1-1.B:** Identify a Sustainability Coordinator within City staff responsible for implementing and coordinating GGRP actions among City departments.

To ensure quality and efficiency in implementing the measures recommended in the GGRP, it is important that the City identifies an internal resource person with dedicated job-hours to carry out the plan.

As science and technology progress, the GGRP needs on-going review to adapt to changing conditions. Outreach programs are needed to communicate the intent of the measures within the community and provide technical assistance in completing the actions. Without dedicating a staff person to this task (either part-time or full-time), it will be challenging for the City to keep the plan on track and monitor its progress toward achieving the community's GHG reduction goals. The Sustainability Coordinator can also help manage inter-departmental coordination to prioritize and implement various reduction measures.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*More focused collaboration and coordination among various City departments, regional agencies and the larger community*

### **Cost to City**

*Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



A Sustainability Coordinator can help keep implementation of the GGRP measures on-track.

### **Did you know? COOL QUOTE**

"Progress occurs when courageous, skillful leaders seize the opportunity to change things for the better."

— Harry Truman

Actions	Implementation Target	Responsible Party
A. Designate a staff person as the City's Sustainability Coordinator. Seek grant funding to support Sustainability Coordinator position and activities.	Before July 31, 2011	Community and Economic Development

Related General Plan policies: Policy 55.1, Policy 55.2

## COMMUNITY LEADERSHIP AND ENGAGEMENT



**Measure 1-1.C:** Commit to adopting Leadership in Energy and Environmental Design (LEED) Silver criteria or an appropriate alternative green building standard for all new buildings to be used or funded by the City.

Leadership in Energy and Environmental Design (LEED) is a voluntary green building rating system created by the U.S. Green Building Council. LEED began in 1993, but has gained momentum over the last few years as a benchmarking tool for assessing a building's performance in relation to energy and water consumption, materials selection, indoor air quality and response to site selection. The rating system certifies buildings based on the number of points they achieve in meeting LEED requirements. There are four levels of certification under LEED in ascending order of points gained: certified, silver, gold, and platinum.

Though jurisdictions all over the country have been adopting or adapting LEED to achieve high-quality, efficient buildings, since 2004, LEED has gained particular attention in California. In 2004, the governor mandated that all new State buildings must achieve at least a LEED Silver rating, with a goal to reduce their energy use by 20% by 2015. Following this mandate, many Californian cities have established LEED as their green building policy.

By committing to establish LEED Silver criteria or an appropriate alternative green building standard for all new public buildings, the City of Citrus Heights will lead by example within the community and support the state's GHG emission reduction goals.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Public buildings with low operating and maintenance costs will help in prioritizing funds for other community projects*

### **Cost to City**

*Low  
(staff expense)*

### **Cost to resident/ business owner**

NA

### **Savings to resident/ business owner**

NA



The new Community Center recently received LEED Gold certification.

### **Did you know? COOL TIP**

The Citrus Heights Community Center has generated 87,956 kilo-watt-hours of power since January 2010. This is equivalent to the power required to run 700 computers for one year, power one residential home for 3.5 years and operate a TV for 633,853 hours.

- City of Citrus Heights, January 2011

Actions	Implementation Target	Responsible Party
A. Prepare and submit to City Council a policy requiring all new public buildings and publicly funded buildings to meet LEED Silver (or an appropriate alternative green building standard) criteria.	Before December 31, 2011	Community and Economic Development; General Services
B. Train City staff to assist the public to understand, implement, and monitor LEED requirements.	Before June 30, 2012	Community and Economic Development; General Services

Related General Plan Policies: Policy 55.1, Policy 55.2, Policy 57.4



## COMMUNITY LEADERSHIP AND ENGAGEMENT



**Measure 1-1.D:** Conduct regular community workshops and education programs to increase community participation and understanding of various transit, energy, water, waste and green infrastructure efficiency strategies and technologies.

A robust community outreach program in Citrus Heights can increase the level of community awareness regarding sustainability issues and can have a ripple effect on community acceptance and implementation of many other measures described in the GGRP. This is the most critical *supporting* measure for facilitating the full potential of all the recommended *primary* measures in the GGRP that rely on community participation.

The City will actively partner with other non-profit organizations in the community, such as the Citrus Heights Collaborative (CHC), Residents Empowerment Association of Citrus Heights (REACH), and other community-wide associations to devise a community workshop and education program schedule. This is a necessary near term effort to ensure that residents and businesses understand the urgency of implementing the actions described in the plan to achieve the community's reduction target by 2020.

### **GHG Reduction Potential:**

*Supporting measure  
(see note below)*

### **Community Co-Benefits:**

*Increase community social  
interaction*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Regular community workshops will help to raise awareness of sustainability issues.

### **Did you know? COOL FACT**

Because addressing all aspects of climate change can be overwhelming, breaking into small working groups to address specific topics makes the job more manageable.

- California Air Resources Board

Actions	Implementation Target	Responsible Party
A. Conduct "how-to" workshops regarding various sustainability related themes.	Ongoing	Community and Economic Development; General Services
B. Create annual / biennial surveys to monitor effectiveness of public workshops and education programs.	Before December 31, 2012	Community and Economic Development; General Services
C. Partner with local non-profit organizations and/or adjacent cities to hold at least one community event or promotion based on a sustainable theme.	Before December 31, 2012	Community and Economic Development; General Services

### Notes and References

*While there are many low-cost ways of increasing public knowledge regarding any given subject, the cost assumption for this measure is based on implementation of a high-tech, integrated public outreach program using various media including digital presentations, video clips, website surveys, phone surveys and other means to reach the community. This supporting measure may be quantified and reported individually with a reduction potential of 49,504 MT CO<sub>2</sub>e/ year based on available data regarding effectiveness of public outreach to modify behavior. However, the GHG reduction capacity is distributed among other primary measures throughout the document that rely heavily on public outreach and involvement. For this reason, GHG reductions achieved through this measure are not counted toward the reduction target to avoid double-counting. The GHG reduction calculation is reported here to affirm the critical importance of an integrated, community-based outreach and social marketing program to the success of the GGRP. Assumptions employed to quantify this measure are described in Appendix B.*

Related General Plan Policies: Policy 53.1, Policy 55.1, Policy 55.2

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## LAND USE AND COMMUNITY DESIGN

Citrus Heights' built-out suburban development context provides limited opportunity to effect land use change. As a result, the GHG inventory does not account for any specific land-use related emissions, but rather considers the effects of land use comprehensively within the transportation sector. This is based on the theory that where people live determines how far they travel to work, to shopping, and to other destinations, and influences whether they choose to walk, bike, use public transit, or drive. If residents live near bus stops, neighborhood-serving commercial centers, or their work places, they are more likely to use alternative lower-emission travel modes than to drive.

The City is not considering changes to land uses or densities in existing residential neighborhoods. The strategies recommended in the GGRP include using alternative housing prototypes in single-family residential neighborhoods, such as co-housing and secondary units. Most land use change within Citrus Heights over the next 10 years will be planned redevelopment to enhance, preserve and expand the City's commercial corridors. The Citrus Heights Redevelopment Agency has identified 558 acres of existing urbanized areas for redevelopment within its 5-year implementation plan (2009–2013). About 70% of these redevelopment areas consist of commercial and retail uses. Sunrise Mall and the Stock Ranch are the largest areas. Therefore, acknowledging the role of land use and community design in reducing GHG emissions within the community remains an important concern.

The recommended measures discussed in this section are *supporting* measures that reduce GHG emissions. They have not been individually quantified, but they have been included in the GGRP to support smart-growth land use strategies that can reduce GHG emissions in the community.

## LAND USE AND COMMUNITY DESIGN: INFILL

**Measure 2-1.A:** Conduct a sustainability audit that evaluates existing plans, ordinances, and development standards to identify regulatory barriers to infill development.



A comprehensive sustainability audit of existing plans, ordinances and development standards can identify provisions in these documents that discourage or restrict infill development in the community. The City is not promoting increased densities in existing neighborhoods. Rather, as a largely built out community, Citrus Heights recognizes that future development will consist mostly of redevelopment and infill.

The City already conducts some Code audits as part of the Housing element updates. However, this measure calls for a more comprehensive approach especially with regard to design guidelines for potential infill areas (for example, a detailed audit of Municipal Code Chapter 106.22 Development and Land Use approval requirements, Chapter 106.30 Standards for all development and land uses, Chapter 106.31 Design Standards etc).

Some development standards for popular destinations such as Sunrise MarketPlace and Auburn Boulevard should also be re-visited to see if there are any further opportunities to accommodate mixed-use infill development within these plans. Also, these plans should be evaluated to see if any other components of the GGRP and General Plan update apply to them, such as complete streets policies, preferential carpool parking spaces, and shared parking.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*High quality design and construction*

### **Cost to City**

*Low*

*(Staff/consultant expense)*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Auburn Boulevard Specific Plan

### **Did you know? COOL FACT**

Infill can encourage a variety of designs and housing options— second units, townhouses, bungalows, studios, and cohousing— which are closer to jobs and services and less expensive than oversized housing at the urban fringe.

- Infill Development, Greenbelt Alliance

Actions	Implementation Target	Responsible Party
A. Review, and adjust if necessary, development standards along the City's major corridors to ensure opportunities exist for mixed-use infill projects.	Before June 30, 2012	Community and Economic Development

*Related General Plan policies: Policy 1.2, Policy 4.1, Policy 4.2, Policy 9.1*



**Measure 2-1.B:** Explore opportunities for various alternative land uses and design prototypes, including co-housing, as infill development options for low-density residential areas.

Future development opportunities in Citrus Heights are found mostly within infill areas, many of which are currently designated for low-density residential use. As the market and economy continue to change, property owners and the City may explore future options for compatible infill development within these neighborhoods. There are many ways to realize land use potential and existing infrastructure capacity. One may be to explore alternative uses and designs, including co-housing and secondary units.

The City will explore the potential for developing an infill housing program by creating templates for alternative housing designs that are compatible within targeted infill neighborhoods and help to maximize land use capacity. The City of Sacramento's Infill Housing Program that fast-tracks alternative designs for single-family neighborhoods if using pre-approved designs, is a good example for this program. Design strategies for such infill projects should be cautious not to change the nature of the surrounding neighborhood, but allow for lower-intensity infill opportunities on vacant properties.

No changes to General Plan land use designations or zoning are being recommended. However, as implementation of the General Plan update and GGRP progress, as the City matures and as market trends change, Citrus Heights may explore ways to integrate alternative designs within residential neighborhoods.

## **GHG Reduction Potential:**

*Supporting measure*

## **Community Co-Benefits:**

*Neighborhood connectivity,*

*Social interaction*

## **Cost to City**

*Low*

*(Staff/consultant expense)*

## **Cost to resident/ business owner**

*NA*

## **Savings to resident/ business owner**

*NA*



Infill development within lower-density neighborhoods maximizes use of existing infrastructure.

## **Did you know? COOL FACT**

A Sacramento Bee editorial marking the fifth anniversary of SACOG's Blueprint plan noted that "nearly 70 percent of new housing built in 2008 was on small lots or condos and townhouses, compared with just 20 percent in 2002, according to the Sacramento Area Council of Governments and Valley Vision".  
- Sac Bee editorial, April 2, 2010

Actions	Implementation Target	Responsible Party
A. Conduct a feasibility study to determine how best to allow alternative uses and designs within vacant low-density residential areas.	Before December 31, 2014	Community and Economic Development
B. Provide outreach in identified neighborhoods.	Before December 31, 2014	Community and Economic Development

## **Notes and References**

*The City of Portland and the City of Santa Cruz also have good examples of infill housing programs promoting density within current vacant lots or large lots in keeping with the harmony of the surrounding neighborhood. This is an effective strategy to increase housing choices in a mostly built-out community.*

**Related General Plan policies: Policy 17.1, Policy 25.1, Policy 25.4**



## LAND USE AND COMMUNITY DESIGN: INFILL



**Measure 2-1.C:** Evaluate existing and planned neighborhood commercial areas and increase bike and pedestrian access to these areas from surrounding residential neighborhoods.

This supporting land use measure will help to effectively implement the City's complete streets policy. To ensure that walking and biking receive similar priority in planning as autos, the City will evaluate existing bike and pedestrian infrastructure and barriers. This is a high priority in current horizontally mixed-use areas.

Horizontal mixed-use areas are found along all the major travel corridors of the city (such as Sunrise Boulevard, Greenback Lane, Auburn Boulevard) with complimenting land uses adjacent to each other. For example, medium density residential next to Sunrise Marketplace, residential uses adjacent to business professional uses on Sunrise Boulevard, residential uses surrounding neighborhood commercial at Sylvan Corners. The City should carefully analyze these horizontal mixed-use areas to ensure proper walking and biking infrastructure and linkages.

Improving the bike- and pedestrian-friendliness of existing and planned neighborhood commercial areas can influence how residents view and consider their transportation choices. Improving walking and biking access within these areas can motivate people to bike and walk more regularly for shorter trips, thereby decreasing GHG emissions caused by driving autos.

### **GHG Reduction Potential:**

*(Included in Transportation and Connectivity Measure 3-5.A)*

### **Community Co-Benefits:**

*Alternative transportation*

### **Cost to City**

*Low-Medium*

*(Staff/consultant expense)*

### **Cost to resident/business owner**

*NA*

### **Savings to resident/business owner**

*NA*



Increasing accessible bike and pedestrian infrastructure can motivate more biking and walking in the community.

### **Did you know? COOL FACT**

Studies conducted in King County, Washington show that the average resident of a walkable neighborhood weighs 7 pounds less than someone who lives in a sprawling neighborhood.

- *Seattle Times, January 24, 2006*

Actions	Implementation Target	Responsible Party
A. Identify potential bike and pedestrian connections between residential and commercial areas.	Before December 31, 2013	Community and Economic Development; General Services

*Related General Plan goals and policies: Policy 29.4, Policy 30.1, Policy 30.4*





# TRANSPORTATION AND CONNECTIVITY

Transportation-related emissions make up the biggest part (43.1%) of Citrus Heights' 2005 GHG emissions inventory. The amount of these emissions is determined largely by the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips between destinations and high numbers of trips create high emissions. Reducing vehicle emissions relies on creating shorter vehicle trips, either by making alternative modes of transportation (such as transit, biking or walking) viable, or by increasing proximity of diverse land uses. Technological advancements in vehicle fuel efficiency and reduction of fuel carbon content will also reduce vehicular GHG emissions. Statewide implementation of AB 1493 fuel efficiency standards and Low Carbon Fuel Standards (LCFS) will reduce future vehicle emissions. According to the Air Resources Board's *Climate Change Scoping Plan*, AB 1493 will improve vehicle efficiency by 15.76% compared to vehicles produced prior to 2009. Implementation of LCFS would also reduce vehicle fuel emissions by 10% across the state. However, these improvements alone will not be enough to achieve the reductions required within the transportation sector to achieve the City's 2020 goal.

According to the 2000 US Census, almost 80% of Citrus Heights residents drove alone to work, about 13% carpoolled, 3% worked from home, 2% used public transit, and less than 2% biked or used another means to get to work. The Citrus Heights' suburban character and the number of residents who work outside the City are key factors in residents' decisions to drive alone to accomplish daily activities. Most household vehicle trips are for commuting or shopping. To reduce communitywide emissions, alternative modes must be used more effectively to move goods and people. Adopting a Complete Streets policy will guide future development of the roadway system and mobility options. Rather than widening roads when congestion gets worse, Citrus Heights will improve streets to better support bikes, busses, and pedestrians. The City will also continue to promote use of Intelligent Transportation Systems to improve flow and reduce idling at intersections. Other steps the City will take to influence resident travel behavior include: improving bike and pedestrian infrastructure throughout the City, encouraging transit enhancements at centers and along major corridors, managing parking demand and supply, and promoting use of alternative fuel vehicles.



Measure 3-1.A: Continue to implement the smart-growth principles established in SACOG's Metropolitan Transportation Plan to the extent feasible.

The Sacramento Area Council of Governments (SACOG) developed the regional Blueprint Plan to analyze transportation needs for 2035. The Blueprint recommends smart-growth principles that facilitate an effective regional transportation network. SACOG's Metropolitan Transportation Plan builds on the Blueprint Preferred Growth Scenario. The goal for the regional plan is to fund alternative transportation projects that integrate local plans to create a seamless regional transit, bicycle and pedestrian system. The Metropolitan Transportation Plan strives to:

- reduce vehicles miles traveled per household by 10%
- hold congested travel per household to less than a 5% increase
- increase bus frequency, add new street cars and light rail, as well as neighborhood shuttles
- add freeway lanes for carpools and commuter buses

Citrus Heights has supported the Blueprint process and will continue to support goals established in SACOG's Metropolitan Transportation Plan. As a nearly built-out community, Citrus Heights will continue to emphasize infill development and redevelopment to accommodate its share of future growth and build a stronger base to facilitate use of alternative transportation. This will also help the City to prioritize funding and construction of alternative transportation systems such as bike lanes, and pedestrian trails.

## **GHG Reduction Potential:**

*Supporting measure*

## **Community Co-Benefits:**

*Create a vibrant community*

## **Cost to City**

*Very Low*

## **Cost to resident/ business owner**

*NA*

## **Savings to resident/ business owner**

*NA*



Smart growth principles promote walkable neighborhoods.

## **Did you know? COOL FACT**

Technological improvements that result in increased fuel efficiency and lower carbon fuels are being overwhelmed by the steady increase in VMT. Since 1980, the number of miles Americans drive has grown 3 times faster than the U.S. population, and almost twice as fast as vehicle registrations.

- Berkeley Climate Action Plan

Actions	Implementation Target	Responsible Party
A. Collaborate with adjacent cities and other regional partners to promote SACOG's smart-growth principles to develop and support alternative transportation.	Ongoing	Community and Economic Development; General Services

*Related General Plan policies: Policy 29.1, Policy 29.6, Policy 33.1*



**Measure 3-1.B:** Work with SACOG's Community Design and CalTrans' Safe Routes to School programs to identify grant opportunities to improve public transit, bicycle and pedestrian networks to serve the community center, libraries, schools, recreational areas and other public gathering spaces.

Recently, the San Juan Unified School District (SJUSD) cut school bus service due to budget constraints. This was a severe blow to the City's alternative transportation system, compelling even more parents to drive their children to school. Without suitable school transportation alternatives, the number of children being driven to school in private automobiles will increase, increasing both transportation-related GHG emissions and congestion of City streets during school hours.

The City will proactively work with SJUSD to prioritize bike and pedestrian infrastructure connecting schools to surrounding residential neighborhoods within two miles. Additionally, the City will work with SJUSD to develop outreach activities and promote participation in various alternative transportation programs, such as Walking School Buses, where children walk to school in adult-supervised and school-coordinated groups.

The City will also encourage SJUSD and other schools in the community to restore and expand school bus service in areas where schools are not easily accessible by walking or biking.

## **GHG Reduction Potential:**

*Supporting measure*

## **Community Co-Benefits:**

*Healthy children*

## **Cost to City**

*Very Low*

## **Cost to resident/ business owner**

*NA*

## **Savings to resident/ business owner**

*NA*



Children walking to school in school-coordinated groups as a "Walking School Bus".

## **Did you know? COOL FACT**

Since Cityhood, the City has been able to obtain nearly \$2,000,000 in Safe Routes state and federal funding to support sidewalk infill projects and walkability education/outreach. This has been possible through tremendous partnerships with the schools, neighborhood associations, and residents living along these corridors.

- City of Citrus Heights

Actions	Implementation Target	Responsible Party
A. Work with SJUSD to develop an outreach program that promotes alternative travel modes for school-related trips.	Before December 31, 2014	General Services
B. Partner with SJUSD to seek funding for alternative transportation modes such as bike- and ped-connections to neighborhoods.	Before December 31, 2016	General Services

*Related General Plan policies: Policy 29.4, Policy 29.6*

## TRANSPORTATION AND CONNECTIVITY: RIDESHARE



**Measure 3-2.A:** Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.

According to the 2000 US Census, almost 80% of Citrus Heights residents drive alone to work. Single-occupancy vehicle travel is a significant part of transportation-related GHG emissions.

The suburban character of Citrus Heights makes it difficult to reach destinations without a car. Moreover, a large percentage of City residents work in adjacent cities. Within this context, a strong rideshare program in Citrus Heights could reduce GHG emissions, while also reducing congestion and household travel costs.

The City will work with SACOG and other agencies to facilitate ridesharing opportunities, including both carpooling and vanpooling. The City will create a rideshare program with the primary goal of achieving a 1.5% mode-shift from single-occupancy vehicles to rideshare alternatives. Specifically, the City will work with partners to upgrade ride-matching systems to use current technologies (e.g., cell phone-enabled ride-match applications), and develop a ride-match social networking website; online electronic payment options; and rideshare stations that provide covered shelter, lighting, and secure bicycle parking.

### **GHG Reduction Potential:**

*1,230 MT CO<sub>2</sub>e/yr*

### **Community Co-Benefits:**

*Improved air quality,  
social networking*

### **Cost to City**

*Low – Medium*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*Low – High*



Signs may be used to identify priority travel lanes and parking spaces for rideshare participants.

### **Did you know? COOL TIP**

If you own a car, it will get better gas mileage when the tires are fully inflated, so it will burn less gas and emit less carbon. Check your car tires once a month to ensure that the tires are fully inflated and save 300 lbs of carbon dioxide for every 10,000 miles you drive and 10 cents per gallon of gas.

Actions	Implementation Target	Responsible Party
A. Create rideshare-designated parking spaces near bus stops, employment centers and commercial areas (e.g., Sunrise MarketPlace, Auburn Boulevard).	Before December 31, 2013	Community and Economic Development
B. Amend the Zoning Code to require preferential parking spaces within new or substantially improved commercial, employment and civic projects designated for carpool and/or vanpool use.	Before December 31, 2012	Community and Economic Development
C. Provide information for employers about potential benefits of car-share programs and the presence of local car rental opportunities.	Before December 31, 2012	Community and Economic Development

*Related General Plan policies: Policy 13.1, Policy 29.1*



## TRANSPORTATION AND CONNECTIVITY: RIDESHARE



Measure 3-2.B: Work with employers to offer incentives and services that increase use of alternatives to single-occupant autos.

The City will work with employers to encourage them to provide commuter trip reduction programs to their employees.

The City will prioritize outreach programs with the larger employers in Citrus Heights. The City will encourage employers with more than 50 employees to provide incentives for using alternative transportation modes. Promoting commuter trip reduction programs such as parking cash-out, transit subsidy, and rideshare help to reduce GHG emissions related to single-occupant vehicles that employees use to get to work every day.

Citrus Heights has a large retail employment base. The City will work with retail owners to find measures that promote alternative transportation among retail employees. Some will consider providing sheltered Class1 bike parking for employees, designating carpool employee-parking spaces, creating a vanpool program and offering transit subsidies.

### **GHG Reduction Potential:**

*(Included in Transportation and Connectivity Measure 3-2.A)*

### **Community Co-Benefits:**

*Less congestion on City streets*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*High*

### **Savings to resident/ business owner**

*Medium – High*



High-occupancy vehicle lanes help carpoolers travel faster to their destination and avoid congestion during peak hours.

### **Did you know? COOL FACT**

A study by the California Air Resources Board has shown that employer-paid parking is not just a substitute for parking that would have been paid for by employees who would drive to work in any case. Rather, employer-paid parking stimulated additional driving to work by 36%.

Actions	Implementation Target	Responsible Party
A. Develop an outreach program to City employers and collaborate with them to identify various commuter trip reduction programs for their employees.	Before December 31, 2015	Community and Economic Development

*Related General Plan policies: Policy 13.1, Policy 29.1*

## TRANSPORTATION AND CONNECTIVITY: PARKING AND TRAFFIC MANAGEMENT



Measure 3-3.A: Conduct a parking management study to monitor implementation of revised 2006 parking standards (CHMC 106.36.080).

Parking policies affect community driving habits. In suburban communities, such as Citrus Heights, parking is usually over supplied. Commercial centers usually provide parking based on the needs of holiday shoppers. So, for most of the year, these parking spaces remain empty. This type of parking planning underutilizes land capacity, drives up development costs, and discourages walking, biking and transit.

In 2006, the City revised minimum parking standards to discourage excessive parking and allow for further parking reductions (CHMC 106.36.070). By reducing parking requirements for multi-family housing, employment centers, civic centers and shopping malls, the City encourages more creative parking solutions, such as parking cash outs, parking rental fees, shared parking, or consolidated parking structures.

The City will conduct a parking management study to evaluate implementation of the revised parking standards. This study will identify vacant or underutilized parking lots and evaluate alternative parking management solutions, such as park-and-ride lots, and shared parking opportunities. Enforcing these parking management strategies will help the City cut community transportation-related GHG emissions, freeing up valuable real estate for new development and tenant space.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Reduced urban heat island effect, improved public spaces, increased land area available for development*



Shared parking between compatible adjacent land uses can increase developable area on a property.

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*High*

### **Did you know? COOL TIP**

By reducing 5 minutes per trip in driving and idling time for a 2,000 space garage, approximately 1,800 tons of carbon dioxide per year can be reduced and approximately 170,000 gallons of wasted fuel can be saved.

*- Based on calculations derived from EPA estimates of carbon dioxide emissions and fuel usage for idling vehicles.*

Actions	Implementation Target	Responsible Party
A. Conduct a feasibility study to evaluate shared parking opportunities for compatible adjacent land uses (e.g., offices next to commercial or multi-family residential uses).	Before December 31, 2012	Community and Economic Development; General Services
B. Evaluate opportunity areas to reduce travel speeds and improve pedestrian use (e.g., Auburn Boulevard Specific Plan).	Before December 31, 2013	Community and Economic Development; General Services
C. Conduct a parking management study to identify vacant or underused parking lots and spaces to convert them to other uses such as park-and-ride lots, motorcycle parking, and shared parking spaces.	Before June 30, 2012	Community and Economic Development; General Services

*Related General Plan policies: Policy 13.4, Policy 53.2*



## TRANSPORTATION AND CONNECTIVITY: PARKING AND TRAFFIC MANAGEMENT



**Measure 3-3.B:** Continue to build an intelligent traffic management system to synchronize traffic signals and allow easy traffic flow movement and reduce GHG emissions caused by vehicle idling.

Citrus Heights has 64 traffic signals. The City is synchronizing the timing of these signals to improve traffic flows and reduce idling times. Reducing frequent “stop-and-go” traffic situations can effectively reduce GHG emissions caused by vehicle idling.

Building an effective intelligent transportation system (ITS) can reduce transportation-related GHG emissions. Synchronized traffic signals can be made more effective by installing ITS software that enables the City to divert and re-route vehicles during peak hours to reduce traffic congestion.

Another effective traffic management tool is use of changeable message signs, especially in popular destinations such as Sunrise Marketplace. To manage traffic congestion during peak shopping seasons, the City can use these signs to direct drivers to the location of available parking, avoiding fuel waste and emissions from drivers circling the parking lot to locate a convenient spot.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Improved air quality*

### **Cost to City**

*Medium – High*

### **Cost to resident/ business owner**

NA

### **Savings to resident/ business owner**

NA



Changeable message signs can divert traffic during peak hours to avoid congestion.

### **Did you know? COOL SAVINGS**

Switch the engine off if you think you are likely to be stationary for more than two minutes.

Plan your trip to avoid congested areas.

Actions	Implementation Target	Responsible Party
A. Continue to enforce speed limits on City streets to maximize gasoline use and minimize GHG emissions.	Ongoing	Police
B. Implement traffic signal coordination on major roadways.	Before December 31, 2013	General Services
C. Use changeable message signs to divert traffic during peak hours to reduce queuing and idling of vehicles at major intersections.	Before December 31, 2012	General Services

*Related General Plan policy: Policy 32.1*



**Measure 3-4.A:** Create infrastructure to promote use of low-carbon and alternative fuel vehicles.

California is fast progressing toward a low-carbon fuel economy. In a suburban context, where driving is necessary to move between various destinations, replacing older and bigger cars with more fuel-efficient cars and alternative fuel (e.g., electric, plug-in hybrid, compressed natural gas) vehicles can create significant reductions from tailpipe emissions.

To support California's Low Carbon Fuel Standards (LCFS), the City will create its own infrastructure to promote low-carbon and alternative fuel vehicles. The City will develop a comprehensive outreach program to educate residents about the benefits of opting for a fuel-efficient vehicle to reduce GHG emissions and household travel costs. The City will also facilitate sales of alternative-fuel vehicles by working with local auto dealers to promote their benefits. The high GHG reduction potential of this measure relies entirely on a successful campaign to promote alternative-fuel vehicles and community participation in replacing inefficient cars with alternative fuel and hybrid cars.

To ensure that the community is prepared for future low-carbon vehicles, the City will also evaluate potential locations for installing electric charging stations.

## **GHG Reduction Potential:**

11,085 MT CO<sub>2</sub>e/yr  
(Hybrid and electric vehicle purchases)

1,125 MT CO<sub>2</sub>e/yr  
(Installation of electric vehicle charging stations)

## **Community Co-Benefits:**

*Create local green jobs, Increase energy independence*

## **Cost to City**

*Medium*

## **Cost to resident/ business owner**

*High*

## **Savings to resident/ business owner**

*Medium - High*



Electric charging stations in front of a retail center.

## **Did you know? COOL SAVINGS**

When replacing your car, look for the most carbon efficient model, or a model with high fuel efficiency. The difference between a car that gets 20 miles per gallon (mpg) and one that gets 30 mpg amounts to \$688 per year (assuming 15,000 miles of driving annually and a fuel cost of \$2.75).

- <http://www.fueleconomy.gov>

Actions	Implementation Target	Responsible Party
A. Amend the Zoning Code to require new or substantially improved multi-family residential, commercial and office projects to provide infrastructure to accommodate alternative fuel vehicles.	Before December 31, 2013	Community and Economic Development
B. Facilitate use of community alternative fuel purchasing co-operatives or fueling stations by promoting their benefits and providing location information at public outreach programs and on City website.	Before December 31, 2015	Community and Economic Development
C. Develop a public outreach program to promote use of hybrid and electric vehicles in the community.	Before December 31, 2013	Community and Economic Development

## **Notes and References**

*Seeking renewable energy sources to power the electric charging stations rather than putting pressure on fossil-fuel generated energy supplies will maximize the GHG reduction potential of this measure.*

**Related General Plan policy: Policy 29.1**



**Measure 3-4.B:** Promote communitywide use of alternative fuels by providing public outreach and education regarding the benefits of low-carbon and alternative fuels.

Citrus Heights already has two alternative fuel filling stations, located at the intersection of Auburn Boulevard and Antelope Road and at the intersection of Sunrise Boulevard and Madison Avenue. However, during public workshops for the GGRP it became evident that the community is not aware of the full benefits such stations offer.

The City will work collaboratively with alternative fuel vendors to develop public outreach programs to promote the use of alternative fuels and provide information to residents regarding the environmental and economic benefits of using low-carbon fuels. This will improve visibility of local and regional alternative fuel stations and encourage residents and businesses to take full advantage of emerging fuel technologies.

The City will conduct a variety of education and outreach programs to reduce resident transport-related emissions. As demonstration projects, the City will use a variety of media outlets to convey messages about good driving practices, car maintenance practices, alternative fuels, and the benefits of purchasing low-carbon vehicles (e.g., electric and hybrid vehicles). For example, tons of GHG emissions saved by driving an alternative-fuel car can be printed on a City-owned alternative-fuel vehicle as a simple way of highlighting the environmental value of the car.

## **GHG Reduction Potential:**

*(Included in Transportation and Connectivity Measure 3-4.A)*

## **Community Co-Benefits:**

*Create local green jobs, increase energy independence*

## **Cost to City**

*Very Low*

## **Cost to resident/ business owner**

*NA*

## **Savings to resident/ business owner**

*NA*



Alternative fuel station at Antelope Road and Auburn Boulevard in Citrus Heights.

## **Did you know? COOL FACT**

Smart, smooth and safe "eco-driving" techniques lead to average fuel savings of 5% to 10%.

Harsh accelerating and braking can use up to 30% more fuel and increase vehicle wear and tear.

Actions	Implementation Target	Responsible Party
A. Implement demonstration projects that use electric and hybrid-electric transportation technologies, biofuels, hydrogen fuel cells, and other clean transportation fuels.	Ongoing	Community and Economic Development
B. Provide eco-driving educational/public outreach programs.	Before December 31, 2012	Community and Economic Development

*Related General Plan policy: Policy 29.1*



**Measure 3-5.A:** Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.

The City already has an adopted Bicycle Master Plan and will prepare a Pedestrian Master Plan in the future. The primary objective of these documents is to provide convenient, continuous, high-quality walking and biking infrastructure in the community. According to the 2000 US Census, walking and biking to work accounted for less than 2% of work-based trips. The City seeks to encourage increased use of these modes for daily trips.

This measure directs the City to implement, and to amend if necessary, the Bicycle and Pedestrian Master Plans to fill system gaps by providing additional bike lanes, sidewalks, and walking paths in the City and along its edges to connect to routes in adjacent communities. The City recently installed bike detectors at some intersections and continues to seek opportunities to create bicycle-friendly intersections when the need arises.

## **GHG Reduction Potential:**

3,730 MT CO<sub>2</sub>e/yr

## **Community Co-Benefits:**

Improved public spaces

## **Cost to City**

Medium – High

## **Cost to resident/ business owner**

NA

## **Savings to resident/ business owner**

NA



Promoting walking in the community will also improve public health.

## **Did you know? COOL TIP**

Walk or bike instead of driving a car. In the United States, automobiles produce over 20% of total carbon emissions. Walk or bike and you will save one pound of carbon for every mile you travel.

Actions	Implementation Target	Responsible Party
A. Re-evaluate the Bicycle Master Plan. Conduct a citywide gap analysis to identify missing links in the bicycle network and prioritize filling gaps to enhance bike travel.	Before June 30, 2012  Ongoing improvements through 2020	General Services
B. Adopt a Pedestrian Master Plan and implement near-term improvements. Conduct a citywide pedestrian walkway analysis to identify locations with physical obstacles within sidewalks, walkways, and trails such as utility poles and prioritize removing these barriers to encourage pedestrian use.	Before December 31, 2013  Ongoing improvements through 2020	General Services

## **Notes and References**

*The Bicycle and Pedestrian Master Plans should include a study of obstacles to bike/pedestrian use. Obstacles such as deteriorated or missing sidewalks, vehicles or vegetation blocking travel, poor intersection visibility, and debris on streets discourage walking and biking. The obstacle study will identify barriers and help the City prioritize facility improvements.*

**Related General Plan policies: Policy 29.1, Policy 29.4, Policy 30.1, Policy 30.2, Policy 30.3, Policy 30.4**





**Measure 3-5.B:** Increase bicycle infrastructure by requiring bicycle parking in new development, retrofitting parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities, and participating in a regional bikesharing program.

Bike parking is essential to support commute and daily shopping/errand trips. The City will identify areas lacking appropriate levels of bicycle parking and will install new facilities. The City will also continue to require new development projects to provide adequate bicycle parking and bicycle infrastructure, such as lockers and showers, in accordance with existing Zoning Code requirements.

Additionally, the City will pursue a multi-jurisdictional bikesharing program with regional partners and adjacent cities. Unlike carsharing, bikesharing systems usually allow one-way trips and sometimes provide short-term (i.e., daily, weekly) membership options. Users check out a bike by credit card, membership card, and/or by cell phone at a docking station. Bikesharing increases mobility by providing an additional, flexible transportation mode.

**GHG Reduction Potential:**

*Supporting measure*

**Community Co-Benefits:**

*Improved public spaces*

**Cost to City**

*Very Low*

**Cost to resident/  
business owner**

*Low – Medium*

**Savings to resident/  
business owner**

*NA*



Providing bike parking in commercial and civic areas can promote bicycling as an alternative to driving for short trips.

**Did you know?  
COOL CHALLENGE**

Plan a climate-friendly vacation: Go bicycling to see sights while traveling. Walking is an even better option. Save fuel and car rental cost while reducing your (and your family's) carbon footprint.

Actions	Implementation Target	Responsible Party
A. Continue to implement City bicycle parking standards (CHMC 106.36.060) for new development and identify ways to retrofit existing development to match these requirements.	Before December 31, 2011	Community and Economic Development
B. Identify areas lacking adequate bike parking. Retrofit parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities.	Before December 31, 2013 Ongoing improvements through 2020	Community and Economic Development
C. Partner with transit agencies and adjacent cities to develop a regional bikeshare program.	Before December 31, 2020	Community and Economic Development

*Related General Plan policies: Policy 13.2, Policy 29.1, Policy 29.2, Policy 29.4, Policy 29.6, Policy 30.1*

## TRANSPORTATION AND CONNECTIVITY: TRANSIT



**Measure 3-6.A:** Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.

The City recognizes that improving the safety, comfort, and convenience of transit stops and stations encourages higher levels of transit ridership. The City will work with Regional Transit to provide shade, weather protection, seating, lighting, and route information at all transit stops in Citrus Heights.

According to the 2000 US Census, less than 2% of Citrus Heights residents used transit to get to work. The City will conduct a public transit gap study to identify barriers to transit ridership in the community. The goal for the transit gap study will be to recommend ways to improve ridership and increase transit mode share by 1% from 2005 base year transit use.

The City will also work with regional transit agencies to evaluate the potential to increase bus frequency and provide real-time bus arrival information at transit stops. Easily accessible arrival information reduces passenger wait time and encourages ridership. The City will work with transit agencies and related organizations to provide arrival displays on boards and cellular phones.

### **GHG Reduction Potential:**

*2,490 MT CO<sub>2</sub>e/yr*

### **Community Co-Benefits:**

*Improved public spaces*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Providing shaded seating areas at bus stops can increase transit ridership.

### **Did you know? COOL FACT**

Using public transit reduces household emissions. Annually, driving an automobile with an average fuel efficiency of 22.9 miles per gallon (mpg) an average of 12,000 miles emits 4.6 MT CO<sub>2</sub>e. Driving a Sport Utility Vehicle or light duty truck with an average fuel efficiency of 16.2 mpg an average of 14,500 miles emits 7.9 MT CO<sub>2</sub>e per year.

Actions	Implementation Target	Responsible Party
A. In collaboration with regional transit agencies, evaluate potential to add public transit service types, including Bus Rapid Transit and community or neighborhood shuttles to regional rail stops.	Before December 31, 2015	City Manager; General Services; Community and Economic Development
B. Ensure that the streetscape improvements for the Phase 1 New San Juan High School improvements implement pedestrian, bike, and public transit amenities.	Before June 30, 2011	Community and Economic Development; General Services
C. Work with Regional Transit to provide shade, weather protection, seating, lighting and route information at all stops in Citrus Heights.	Before December 31, 2015	General Services, Community and Economic Development

*Related General Plan policies: Policy 13.3, Policy 29.1, Policy 29.2, Policy 31.1, Policy 31.2, Policy 31.2, Policy 31.3, Policy 31.4*



## TRANSPORTATION AND CONNECTIVITY: TRANSIT



Measure 3-6.B: Work with Regional Transit, E-Tran, Roseville Transit, Amtrak and other transit agencies to develop a regional pass system.

Most Citrus Heights residents work outside the City. Driving to work in single-occupancy vehicles is the greatest contributor to communitywide GHG emissions.

The City will seek regional partnerships to provide convenient transit options for residents and employees within the community. One deterrent to frequent transit use between cities is the need to buy separate tickets from respective agencies in those cities.

The City will collaborate with regional partners to develop a regional pass system, resulting in higher transit ridership based on increased ease of use of the pass system between adjacent cities. For example, if a Citrus Heights resident goes to work in Roseville but travels to Sacramento for a meeting, the regional pass system provides the convenience of using a single transit pass to move among the three cities without purchasing different tickets in each place.

### **GHG Reduction Potential:**

*(Included in Transportation and Connectivity Measure 3-6.A)*

### **Community Co-Benefits:**

*Improved air quality, less congestion on City streets*

### **Cost to City**

*Very Low*

### **Cost to resident/business owner**

*NA*

### **Savings to resident/business owner**

*Very Low*



A regional transit pass system would enable Citrus Heights residents and employees to more conveniently travel to adjacent destinations.

### **Did you know? COOL TIP**

In 2005, using public transportation saved 6.9 million metric tons of carbon in United States. Studies shows that using public transit instead of single-occupancy vehicles also reduced congestion on streets, thereby reducing GHG emissions caused by idling vehicles.

Actions	Implementation Target	Responsible Party
A. Partner with SACOG and local transit agencies to develop a regional transit pass program.	Before December 31, 2015	General Services

*Related General Plan policies: Policy 13.3, Policy 29.1, Policy 29.2, Policy 31.1, Policy 31.2, Policy 31.2, Policy 31.3, Policy 31.4, Policy 33.1*

## TRANSPORTATION AND CONNECTIVITY: MUNICIPAL



**Measure 3-7.A:** Improve fuel-efficiency of the City fleet by purchasing low or zero-emission vehicles when vehicles are retired from service.  
(Public safety vehicles are exempted from this requirement.)

To lead by example, the City will gradually replace its existing vehicle fleet with fuel-efficient hybrid vehicles in the future. In doing so, the City can promote the purchase and sale of fuel-efficient vehicles in the community.

The City recognizes that purchasing low or zero-emission vehicles will also lower operating costs. However, most of the City fleet is still in new condition. Rather than replacing the fleet immediately, the City proposes to replace it gradually as the existing vehicles are retired.

To prepare for future low-carbon hybrid vehicles and to accommodate hybrids owned by current City employees or visitors, the City will create designated electric/ hybrid vehicle charging and parking spaces within City facility parking lots.

### **GHG Reduction Potential:**

40 MT CO<sub>2</sub>e/yr

### **Community Co-Benefits:**

Improved air quality,  
lower operating costs

### **Cost to City**

Low – High

### **Cost to resident/ business owner**

NA

### **Savings to resident/ business owner**

NA



Using low emission vehicles for municipal purposes can promote the purchase and sale of low emission vehicles in the community.

### **Did you know? COOL FACT**

Compared to gasoline-fueled cars that emit almost 19.6 pounds of GHGs for every gallon used, low-emission vehicles emit 1 pound of hydrocarbons into the atmosphere over 100,000 miles of driving. Compressed Natural Gas vehicles produce 15 to 20 percent less GHGs than gasoline-fueled vehicles.

Actions	Implementation Target	Responsible Party
A. Update designated electric/hybrid vehicle charging spaces within City parking lots.	Before December 31, 2012	General Services
B. Replace existing City vehicles with fuel-efficient vehicles when they are retired from service.	Ongoing through 2020	General Services

### Notes and References

According to the City Fleet Manager's current estimates, five existing City cars will be replaced with hybrids in the next five to eight years. Ten more will be replaced in the next 10 to 15 years.

Related General Plan policies: Policy 55.1, Policy 55.2



**Measure 3-7.B:** Provide financial incentives to encourage ridesharing and/or public transit use among City employees.

The City currently has 212 employees. Citrus Heights has already taken proactive steps to promote employee commuter trip reduction programs, including flexible hours. Half of the City's employees participate in its 9/80 work schedule program, reducing commuter trips.

The City will actively promote other commuter trip reduction programs, such as providing transit subsidies, and/or carpools among its employees. The intent of this measure is to reduce the number of employees driving single-occupancy vehicles to work. The City can also create its own vanpool system for employees living in the same neighborhoods or communities.

One concern among employees lacking a car during the day is an inability to run errands if necessary during lunch, or to attend to emergency situations. The City will research car-share programs to make a certain number of cars available to employees during emergencies. This step can encourage more effective participation in commuter trip reduction programs.

**GHG Reduction Potential:**

60 MT CO<sub>2</sub>e/yr

**Community Co-Benefits:**

Social networking

**Cost to City**

Very Low

**Cost to resident/  
business owner**

NA

**Savings to resident/  
business owner**

Very Low – Low



Explore potential for creating an employee vanpool program.

**Did you know?  
COOL FACT**

Studies indicate that ridesharing programs typically attract 5-15% of commute trips if they offer only information and encouragement, and 10-30% if they also offer financial incentives such as parking cash-outs or vanpool subsidies.

- Victoria Transport Policy Institute

Actions	Implementation Target	Responsible Party
A. Provide transit subsidies to City employees.	Before December 31, 2012	City Manager; Human Resources and City Information
B. Explore creation of a vanpool program to pick up City employees from designated stops.	Before December 31, 2013	City Manager; Human Resources and City Information

*Related General Plan policies: Policy 55.1, Policy 55.2*

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## ENERGY EFFICIENCY AND CONSERVATION

Citrus Heights has a substantial opportunity to reduce communitywide GHG emissions related to energy use in residential and commercial buildings. According to the GHG baseline inventory, energy used in homes and businesses (for heating, cooling, lighting, and to power appliances) comprises a similar amount of emissions as transportation. Residential energy use comprises 29.6% of total energy use, whereas commercial energy use comprises 11.5%.

Compared to other California jurisdictions, Citrus Heights is nearly built out, and a substantial number of residents work in adjacent cities. Therefore, the potential to achieve reduced emissions through land use and transportation change is limited. However, the majority of the City's commercial uses and homes were built before California's Title 24 energy efficiency standards took effect. Retrofitting commercial buildings and homes to meet current energy efficiency standards thus offers greater potential to achieve emission reductions compared to other GGRP strategies.

Emissions produced due to building energy use vary depending on how the energy is generated, and the type of energy used (i.e., electricity or natural gas). Most energy-related GHG emissions are created by burning fossil fuels. Thus, finding clean burning alternative fuel sources is a critical step to reduce emissions. For example, natural gas is a cleaner fuel than electricity generated at a coal-fired power plant. However, they both contribute to GHG emissions. A better option would be to seek energy produced from renewable sources, which have negligible GHG emissions. To achieve State-mandated Renewable Portfolio Standards, the City of Citrus Heights should collaborate with local utility companies (e.g., SMUD and PG&E) to identify ways to minimize energy consumption and maximize use of renewable energy sources.



## ENERGY EFFICIENCY AND CONSERVATION: NEW CONSTRUCTION



Measure 4-1.A: Implement Construction Air Quality Mitigation Plan protocols and Best Management Practices set forth by the Sacramento Metropolitan Air Quality Management District (SMAQMD).

either the Air Resources Board (ARB) or Sacramento Metropolitan Air Quality Management District (SMAQMD) have yet proposed any GHG emissions mitigation measures directly related to construction activity. However, SMAQMD has adopted protocols for mitigation if a proposed project's construction emissions exceed the threshold of significance for NOx emissions, and has developed recommended measures for reducing GHG emissions from construction activities. The City will use this guidance to evaluate construction related GHG emissions. In most cases, reducing NOx emissions and controlling emissions from off-road construction equipment will also indirectly reduce GHG emissions related to construction.

During the GGRP plan period, most construction in the City will be related to future land uses and construction in road rights-of-way to implement complete streets policies. To reduce the effect of the future construction emissions, the City will require Construction Air Quality Mitigation Plans (CAQMP) for construction projects exceeding the SMAQMD NOx threshold of significance (85 pounds/day). The City will also require incorporation of SMAQMD-recommended Best Management Practices (BMPs) for these projects to reduce GHG emissions.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Improve air quality*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Construction Air Quality Mitigation Plans will be required for new construction projects.

### **Did you know?**

#### **COOL TIP**

The California Air Resources Board estimates that the mandatory provisions in the California Green Building Code will reduce greenhouse gas emissions by 3 million metric tons in 2020. Additionally, the provisions will reduce water use by 20% and divert 50% of construction waste from landfills.

<b>Actions</b>	<b>Implementation Target</b>	<b>Responsible Party</b>
A. Require submission of a Construction Air Quality Mitigation Plan for future projects exceeding the SMAQMD NOx threshold of significance (85 pounds/day).	Ongoing	Community and Economic Development; General Services
B. In CAQMPs prepared for future projects, require incorporation of applicable SMAQMD-recommended Best Management Practices for construction.	Ongoing	Community and Economic Development; General Services
C. Offer selection preference for contractors who use low-emission equipment and low-carbon fuels in their equipment when bidding on City contracts.	December 31, 2012	Community and Economic Development; General Services

*Related General Plan policies: Policy 40.1, Policy 40.2, Policy 49.4, Policy 53.1*



## ENERGY EFFICIENCY AND CONSERVATION: NEW CONSTRUCTION



**Measure 4-1.B:** Modify City codes to require new buildings to maximize solar access to promote passive solar energy design, natural ventilation, effective use of daylight, and on-site solar generation.

The City will conduct an audit of current codes and regulations (CHMC Chapters 106.30, 106.31.030, 106.31.040, and 106.34) and update to incorporate specific requirements that promote passive and active solar design, natural ventilation and effective use of daylight within new construction. As we continue to tighten and seal our buildings, the ability to use free light and air diminishes. Careful planning and design during building siting can maximize the use of natural sun and air, and reduce energy bills for heating, cooling and lighting.

The City will also develop a Solar Access ordinance to reduce conflicts among adjacent properties regarding placement of solar panels. A Solar Access ordinance would help balance community priorities regarding mature tree preservation and shade considerations relative to solar equipment (based on guidance in CHMC Chapter 106.39.070 and California Green Building Code Section 504.5). While landscaping can improve air quality, reduce heat island effects and promote passive solar heating and ventilation, it can also inadvertently shade areas conducive to active solar systems. Since the city is nearly built out and there is limited opportunity to reorient existing buildings for better solar access and vegetative cover, the Solar Access ordinance may give precedence to the needs of mature tree preservation within residential neighborhoods over shade considerations for solar equipments on a property as a more cost-effective way of reducing building energy need and emissions.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Lower energy bills*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*Medium – High*

### **Savings to resident/ business owner**

*Medium – High*



Design considerations that allow natural ventilation and daylighting can reduce energy costs.

### **Did you know? COOL SAVINGS**

Drying laundry on a clothesline can reduce carbon dioxide by up to 90%. You can save 700 pounds of carbon dioxide when you air dry your clothes for six months out of the year.

Actions	Implementation Target	Responsible Party
A. Explore creation of a solar access ordinance.	Before December 31, 2012	Community and Economic Development
B. Conduct public workshops to promote the health and economic benefits of passive solar design, natural ventilation and daylighting.	Ongoing	Community and Economic Development

*Related General Plan policies: Policy 40.1, Policy 40.2, Policy 41.2*

## ENERGY EFFICIENCY AND CONSERVATION: NEW CONSTRUCTION



**Measure 4-1.C:** Require use of recycled content building materials in new construction projects.

GHG emissions occur within the total lifecycle of building materials, from resource extraction or excavation, through the production process, transportation, use of finished products, and disposal. By instituting a recycled materials requirement, the City can ensure that the building community is using best-available green building products during construction. This promotes good construction management practices by encouraging recycling of building materials, reusing salvaged products after demolition and using locally available and durable materials.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Reduce waste,  
create local jobs*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*High*

### **Savings to resident/ business owner**

*NA*



Reusing salvaged construction materials reduces energy used to produce new materials.

### **Did you know? COOL CHALLENGE**

Buy durable goods. As much as possible, buy items that will last instead of buying the same item several times in a decade. Reusing, repairing, or refurbishing surplus office furniture and equipment is less expensive than purchasing new materials.

Actions	Implementation Target	Responsible Party
A. Amend the Building Code and inspection procedures to require use of recycled materials.	Before December 31, 2012	Community and Economic Development
B. Create a directory of locally available construction materials (within a 500-mile radius) that can be used for new construction and substantial renovations.	Before June 30, 2012	Community and Economic Development

### Notes and References

*This is a supporting measure to provide the full benefit of green building design techniques in new construction. Though the measure cannot be individually quantified, it provides an additional opportunity to positively affect design, construction and demolition practices, creating a cumulative GHG reduction over the implementation period.*

*Related General Plan policy: Policy 41.3*

## ENERGY EFFICIENCY AND CONSERVATION: FINANCIAL INCENTIVES



**Measure 4-2.A:** Develop a Solar Buying Assistance program to provide zero-interest loans to homeowners who purchase grid-tie solar power systems.

In September 2008, the California legislature enacted AB 811 to assist municipalities to achieve residential and commercial property retrofits. AB 811 provides for low-interest loans to support renewable and energy-efficient retrofits (permanently fixed to the property) that are paid for using tax assessments.

Citrus Heights has joined with other California jurisdictions in the CaliforniaFIRST program. Participating in this program provides Citrus Heights residents an opportunity to participate in a Solar Buying Assistance program to offset the high up-front costs of solar installation. Although solar systems provide high savings over time, the initial cost to purchase and install these systems has often discouraged participation.

By developing a Solar Buying Assistance program with a variety of financing options, the City can promote higher community participation and maximize renewable energy generation. In partnership with utility companies, the City can also estimate a building's energy needs and propose the appropriate system size for individual buildings.

Based on solar-energy capacity required, the City can determine various financing options for the assistance program such as on-bill financing, revolving low interest loans, and energy-efficient mortgages.

### **GHG Reduction Potential:**

*(Included in Energy Efficiency and Conservation Measure 4.2.B)*

### **Community Co-Benefits:**

*Increased energy independence*

### **Cost to City**

*Low*

### **Cost to resident/ business owner**

*High*

### **Savings to resident/ business owner**

*High*



As a participant in CaliforniaFIRST, Citrus Heights can develop a Solar Buying Assistance program.

### **Did you know? COOL TIP**

CFLs use 75 percent less energy than incandescent. Unlike incandescent bulbs CFLs have the distinct advantage of being designed in a way that their mercury can be collected and recycled at the end of their average seven to twelve year life cycle.

Actions	Implementation Target	Responsible Party
A. Continue to participate in CaliforniaFIRST or similar program to provide outreach, financial incentives and other technical assistance to home and business owners.	Ongoing	Community and Economic Development

### **Notes and References**

*In December 2009, Citrus Heights City Council adopted a resolution to join CaliforniaFIRST, The CaliforniaFIRST program, developed by the California Statewide Communities Development Authority, provides financing to property owners for energy and water efficiency improvements as well as solar installations on their property.*

*Related General Plan policies: Policy 41.2, Policy 55.1*

# ENERGY EFFICIENCY AND CONSERVATION: FINANCIAL INCENTIVES



**Measure 4-2.B:** Collaborate with utility companies to provide financial incentives/rebates for residential and commercial buildings to upgrade from inefficient water heaters to solar water heaters.

The high capital cost of water heater upgrades can pose a financial burden to building owners. However, studies show that solar water heaters can reduce energy-related GHG emissions.

Citrus Heights will collaborate with SMUD, PG&E and other non-profit organizations to identify various local, state or national financing options for residents and businesses to voluntarily replace inefficient water heating systems with solar water heaters. A number of financing options may be offered to reduce up-front costs, such as on-bill financing, low-interest loans, and revolving loans under AB 811 and the CaliforniaFIRST program.

The City, in partnership with utilities, will actively promote and facilitate the installation of 5 Watt-hour (Wh) systems on commercial and residential buildings. The City will also create outreach programs to provide information about the benefits of solar heaters and installation and maintenance assistance to maximize community participation.

## GHG Reduction Potential:

7,480 MT CO<sub>2</sub>e/yr  
(residential)

1,190 MT CO<sub>2</sub>e/yr  
(commercial)

## Community Co-Benefits:

Create local green jobs,  
increase home equity

## Cost to City

Very Low

## Cost to resident/ business owner

High (one time)

## Savings to resident/ business owner

Very Low – Low

(recurring savings)



Solar water heaters can considerably reduce energy-related GHG emissions.

## Did you know? COOL SAVINGS

Solar water heaters avoid a portion of the greenhouse gas emissions associated with electricity production. During a 20-year period, one solar water heater can avoid more than 50 tons of carbon dioxide emissions.  
- U.S Department of Energy

Actions	Implementation Target	Responsible Party
A. Develop a resident outreach program, remove code barriers, and implement permit streamlining for solar water heater installation on residential buildings.	Before December 31, 2012	Community and Economic Development
B. Develop a business outreach program, remove code barriers, and implement permit streamlining for solar water heater installation on commercial buildings.	Before December 31, 2012	Community and Economic Development
C. Collaborate with utilities to offer low-interest loans for homeowners with swimming pools to switch to solar water heating systems.	Before June 30, 2013	Community and Economic Development
D. Collaborate with utilities and other agencies to provide public information about local, regional, state and national funding sources and financial incentives to support installation and maintenance of solar water heaters.	Ongoing	Community and Economic Development; General Services

## Notes and References

A number of statewide funding programs (including \$358.3 million from the California Public Utility Commission, and the \$305.8 million California Solar Initiative) have been made available since January 2010 to provide incentives for market development and installation of 5Wh solar thermal systems (including solar hot water systems, photovoltaic etc). The approximate cost of a solar water heater is \$5,000 (based on 2010 national average costs).

Related General Plan policies: Policy 41.2, Policy 55.1



# ENERGY EFFICIENCY AND CONSERVATION: FINANCIAL INCENTIVES



**Measure 4-2.C:** Create a community-wide Solar Power program and remove physical and code barriers to support installation of solar panels in commercial and residential districts.

The City will partner with SMUD and businesses offering solar panel leases (such as Solar City) to create a community-wide Solar Power program. Maximizing performance depends on proper siting, design, installation, quality and maintenance of the solar systems.

By creating a Solar Power program, the City can identify the best available locations for solar installations in the community. The location and weather pattern (including incoming solar insolation) in Citrus Heights is generally conducive to solar power generation. Larger systems provide higher return on investment for both power generation and payback time. Citrus Heights has a great opportunity to use large, unshaded roofs and parking surfaces within its extensive commercial corridors for this purpose. The City will also encourage appropriate residential-scale solar installations, especially in areas with large lots or large multi-family buildings.

The intent of establishing a Solar Power program for large-scale (commercial) and small-scale (residential) power systems is to accelerate solar panel installation, operation and maintenance by connecting owners to information, products, and local companies. Through a streamlined permitting and installation process, the City can further incentivize solar power.

## **GHG Reduction Potential:**

*2,400 MT CO<sub>2</sub>e/yr  
(500,000 sq.ft of commercial)*

*9,300 MT CO<sub>2</sub>e/yr (10% of  
total residential rooftops)*

## **Community Co-Benefits:**

*Create local green jobs,  
increase commercial rental  
space by including roof as  
leasing space*

## **Cost to City**

*Low – Medium*

## **Cost to resident/ business owner**

*Very Low – Low*

## **Savings to resident/ business owner**

*Medium – High*



Unshaded roof surfaces on large commercial buildings provide ample space for leased or owned solar panels.

## **Did you know? COOL FACT**

In 2008, 7% of total energy produced in U.S was from renewable sources. 1% of total renewable energy produced was solar.

Actions	Implementation Target	Responsible Party
A. Partner with SMUD, businesses offering solar panel leases, and other relevant organizations to identify appropriate locations for solar installations within Citrus Heights.	Before December 31, 2013	Community and Economic Development
B. Work with businesses and home owners who do not have suitable solar access on their property to participate in SMUD's Solar Shares program (utility-scale solar system) in exchange for offsets on their electricity bill.	Before June 30, 2012	Community and Economic Development
C. Develop an outreach program, remove code barriers, and implement permit streamlining for photovoltaic panel installation on residential and commercial buildings.	Before December 31, 2012	Community and Economic Development

## **Notes and References**

Several businesses provide full-service solar power system design, financing, installation and monitoring services and lease solar power systems to homeowners, businesses and government organizations in the region.

**Related General Plan policies: Policy 41.2, Policy 55.1**



## ENERGY EFFICIENCY AND CONSERVATION: BUILDING RETROFITS

**Measure 4-3.A:** Develop a Residential Energy Benchmark program to assist homeowners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.



Most homes in Citrus Heights were constructed during the 1960s and 1970s. About 60% of the City's housing stock was built prior to Title 24. The community can reduce GHG emissions by retrofitting older homes to comply with Title 24 standards. Title 24 energy efficiency standards for new construction have also improved over the years so that buildings constructed in the last 15 years, in particular, perform much better than buildings constructed 15 to 30 years ago. There may also be a significant opportunity for buildings constructed between 1980 and the mid-1990s to significantly improve energy efficiency by following an Energy Benchmarking program.

By customizing a Citrus Heights specific Residential Energy Benchmark program based on the Title 24 standards, the City can provide flexibility in the program while outlining measures to reduce GHG emissions, increase household energy efficiency, and decrease energy bills. Measures will include sealing building envelopes through insulation and weatherization, and replacing older windows with modern energy efficient windows. The City will partner with utility companies, to provide residential energy audits to determine baseline energy use, then guide homeowners regarding how best to reduce building energy consumption by 40% from the established baseline by 2020.

### **GHG Reduction Potential:**

5,730 MT CO<sub>2</sub>e/yr

### **Community Co-Benefits:**

*Reduced energy bills, increased home equity*

### **Cost to City**

*Low – Medium*

### **Cost to resident/ business owner**

*High*

### **Savings to resident/ business owner**

*Medium*



An Energy Benchmark system develops grades to describe the energy performance of a building.

### **Did you know? COOL TIP**

A programmable thermostat can automatically coordinate the indoor climate with your daily and weekend activity patterns to reduce cooling bills by up to 10%. EPA estimates proper use of pre-programmed settings on a programmable thermostat can yield yearly savings of about \$150 in energy costs.

Actions	Implementation Target	Responsible Party
A. Partner with SMUD and PG&E (or other related organizations such as Flex Your Power) to organize public outreach programs to promote building envelope-related energy efficiency upgrades (such as windows, attic insulation) in residential buildings.	Ongoing	Community and Economic Development
B. Provide information and technical assistance through the City's Building Green web link about retrofitting homes with energy-efficient measures.	Ongoing	Community and Economic Development
C. Collaborate with local financing companies and real estate agencies to promote Energy Efficient Mortgages.	Before December 31, 2012	Community and Economic Development

*Related General Plan policies: Policy 41.2, Policy 41.3, Policy 55.1*



**Measure 4-3.B:** Develop a Commercial Energy Benchmark program to assist business owners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.

The Citrus Heights community has a strong commercial base. The City's commercial districts extend along major travel corridors such as Greenback Lane, Sunrise Boulevard, and Auburn Boulevard. Most commercial buildings were built prior to Title 24 energy efficiency standards.

Similar to the aging residential stock, Citrus Heights' commercial and office buildings provide great opportunity to reduce GHG emissions through building envelope upgrades. By developing an Energy Benchmark program, the City will encourage higher levels of voluntary participation and acceptance of the program. Measures will include sealing building envelopes through insulation and weatherization, replacing old windows with modern energy efficient windows, and converting older inefficient boilers with new Energy Star models. The City will partner with utility companies to provide energy audits for commercial and office buildings to determine their baseline energy use, then guide business owners regarding how best to reduce building energy consumption by 30% from the established baseline by 2020. As Title 24 standards have also improved over the past 30 years, even buildings built after Title 24 implementation can be significantly upgraded to meet current standards.

## **GHG Reduction Potential:**

*1,490 MT CO<sub>2</sub>e/yr*

## **Community Co-Benefits:**

*Reduced energy bills,  
increased  
rental space equity*

## **Cost to City**

*Low – Medium*

## **Cost to resident/ business owner**

*High*

## **Savings to resident/ business owner**

*High*



An energy-efficient office space with natural daylighting.

## **Did you know?**

Upgrading from a T-8 to T-5 ballast will save 34 to 56% energy and payback occurs within 2 years (less than 12 months for high usage applications). T-5 ballasts last approximately 20,000 hours, reducing maintenance costs by halving relamping requirements.

Actions	Implementation Target	Responsible Party
A. Partner with SMUD and PG&E (or other related organizations such as Flex Your Power) to organize public outreach programs to promote building envelope-related energy efficiency upgrades in commercial and office buildings.	Ongoing	Community and Economic Development
B. Promote building re-commissioning (e.g. checking, repairing, and adjusting the HVAC, lighting, and hot water systems) prior to tenant improvement approval by providing a database for commissioning companies.	Before December 31, 2015	Community and Economic Development
C. Collaborate with SMUD and PG&E (or other energy service companies) to offer free energy audits to residents and life-cycle Investment Grade Audits (IGAs) for business owners	Before December 31, 2012	Community and Economic Development

*Related General Plan policies: Policy 41.2, Policy 41.3, Policy 55.1*

## ENERGY EFFICIENCY AND CONSERVATION: BUILDING RETROFITS



**Measure 4-3.C:** Develop a Multi-family Energy Efficiency program to provide comprehensive, performance-based energy testing and installation of energy saving improvements for qualified multi-family residents.

Energy conservation is especially challenging in the residential rental sector because typically the party financing the renovation is not the beneficiary of the investment. The landlord is typically responsible for financing an energy efficiency improvement but does not directly benefit from resulting utility cost savings. Individual meters in multi-family buildings provide tenants incentives to conserve energy as they are billed for energy use on a per unit basis, rather than a flat-rate based on the average energy consumption of other tenants.

Citrus Heights has a large multi-family rental housing stock. Many rental units are occupied by low-income families. By developing a Multi-family Energy Efficiency program, the City can influence energy efficiency improvements in this sector. Partnering with utility companies, the City will actively seek funding to provide information to landlords and renters and to provide financial incentives to complete voluntary energy efficiency improvements.

### **GHG Reduction Potential:**

*(Included in Energy Efficiency and Conservation Measure 4.2.D)*

### **Community Co-Benefits:**

*Improved quality of life,  
reduced energy bills,  
increased equity in rental  
space*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*Low – Medium*

### **Savings to resident/ business owner**

*High*



Proper insulation and weatherization of buildings can reduce energy loss due to infiltration.

### **Did you know? COOL FACT**

Plugging appliances (like TVs) which use standby settings into powerstrips and turning them off can save almost \$23 per year.

- Chicago Climate Action Plan

Actions	Implementation Target	Responsible Party
A. Collaborate with utility companies and require that all new multi-tenant buildings be sub-metered to allow each tenant the ability to monitor their own energy use.	Before December 31, 2012	Community and Economic Development
B. Continue to use existing City rehabilitation programs to provide weatherization improvements in low-income units.	Ongoing	Community and Economic Development
C. Collaborate with utility companies to provide financial incentives for energy improvements and appliance upgrades.	Before June 30, 2013	Community and Economic Development

*Related General Plan policies: Policy 40.1, Policy 41.1, Policy 41.2, Policy 41.3*

## ENERGY EFFICIENCY AND CONSERVATION: BUILDING RETROFITS



**Measure 4-3.D:** Develop an Energy Efficient Upgrade program for residents and business owners to promote upgrades from inefficient appliances, lighting and roofing to Energy Star certified systems.

This is one of the most critical measures recommended in the plan. It is based on voluntary community participation to gradually upgrade home and business appliances, lighting and roofing to Energy Star models. Successful implementation of this measure relies on a robust public outreach program to increase community awareness regarding building appliance choices.

Modern technology has contributed to the development of high-quality and energy-efficient appliances. The Energy Star rating is an internationally recognized standard for energy efficient consumer products. By promoting Energy Star-rated home and business appliances, the City can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computer monitors, copy machines, and exit signs. The City will also promote use of Energy-Star rated cool roofs when new roofs are installed on existing buildings.

The City will partner with utilities and other relevant organizations to seek funding strategies and financial incentives to support appliance replacements.

### **GHG Reduction Potential:**

*12,340 MT CO<sub>2</sub>e/yr*

### **Community Co-Benefits:**

*Reduced energy bills*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*Medium – High*

### **Savings to resident/ business owner**

*Low – Medium*



Upgrading home and business appliances to Energy Star-rated appliances lowers energy bills.

### **Did you know? COOL FACT**

Refrigerators are usually the single biggest energy user in a typical home. Energy Star refrigerators are 50% more efficient than those made before 1993, 40% more efficient than those made in 2001 and 15% more efficient than those required by federal regulation in 2007.

Actions	Implementation Target	Responsible Party
A. Collaborate with utility companies and other non-profit agencies to develop a comprehensive outreach and financial incentives program to encourage voluntary replacement of inefficient appliances with new Energy Star appliances.	Before December 31, 2012	Community and Economic Development

### **Notes and References**

*The GHG reduction potential of this measure is based on the Climate and Air Pollution Planning Assistant model developed by ICLEI - Local Governments for Sustainability. Performance indicators and assumptions for this measure are outlined in Chapter 4.*

*Related General Plan policies: Policy 40.1, Policy 41.1, Policy 41.2, Policy 41.3*



## ENERGY EFFICIENCY AND CONSERVATION: BUILDING RETROFITS

Measure 4-3.E: Collaborate with local utility companies and adjacent cities to accelerate smart-grid integration in the community.



The smart grid is an emerging energy management system which combines information technology with renewable energy to significantly improve how electricity is generated, delivered, and consumed.

In 2008, SMUD and its regional partners won federal grants to accelerate integration of the smart-grid program. SMUD's first smart-grid phase to be completed by 2012 includes installation of smart meters. PG&E has installed nearly 28,000 smart meters in Citrus Heights. Smart meters provide utility customers with access to detailed energy use and cost information, new dynamic pricing programs based on peak-energy demand, and the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort and convenience. The true value of the smart grid program will be fully realized when community residents and businesses begin making more informed energy use decisions based on the two-way communication enabled by smart meters, such as when a homeowner is able to program their washing machine to run when energy is cheapest to obtain.

When estimating the potential GHG emission reductions associated with implementation of the smart grid, the City included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings.

### GHG Reduction Potential:

1,510 MT CO<sub>2</sub>e/yr  
(Existing residential)

1,050 MT CO<sub>2</sub>e/yr  
(Existing commercial)

600 MT CO<sub>2</sub>e/yr  
(New construction)

### Community Co-Benefits:

Lower utility bills

#### Cost to City

Low

#### Cost to resident/ business owner

NA

#### Savings to resident/ business owner

Low



Smart meters enable two-way wireless communication between utilities and consumers.

### Did you know? COOL FACT

Get a home energy audit. Many utilities offer free home energy audits to find where your home is poorly insulated or energy inefficient. You can save up to 30% off your energy bill and 1,000 lbs of carbon dioxide a year.

- <http://globalwarming-facts.info/50-tips.html>

Actions	Implementation Target	Responsible Party
A. Partner with SMUD and PG&E to develop a community smart grid integration plan.	Before July 30, 2013	Community and Economic Development
B. Develop an outreach program that informs property owners and businesses about benefits of smart grid and smart appliances.	Before December 31, 2013	Community and Economic Development
C. Adopt an ordinance to require smart grid energy management systems and compatible heating, ventilation, air conditioning and lighting in new construction.	Before December 31, 2015	Community and Economic Development

### Notes and References

According to CISCO, full integration of the smart grid will take time to realize, but energy analysts estimate it will ultimately be capable of reducing electricity-related GHG emissions by between four and 30% below current levels.

Related General Plan policies: Policy 41.1, Policy 41.3, Policy 55.1



## ENERGY EFFICIENCY AND CONSERVATION: SCHOOLS



Measure 4-4.A: Coordinate with SJUSD to create high-energy performing schools by adopting green school design principles.

Schools prepare future Citrus Heights residents to lead a sustainable life. Climate change science provides schools an opportunity to prepare our children to live more sustainably and adapt to the effects of a changing climate.

A school building should itself be an example of sustainable design and behavior. The way a building is designed can influence the student's response and life choices. For example, in an energy efficient school that uses occupancy and daylight sensors to control lighting, students learn that lights in a room should be turned off when not in use or when there is enough daylight to illuminate the room.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Improved quality of life*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Artist's rendering of the New San Juan High School.

### **Did you know?**

Green schools cost less to operate, freeing up resources to truly improve students' education. If a green school saved \$100,000 per year in operational costs, that's roughly enough to hire two new teachers, buy 200 new computers or purchase 5,000 new textbooks.

- U.S. Green Building Council

Actions	Implementation Target	Responsible Party
A. Encourage SJUSD to integrate best practices for energy efficiency and conservation based on the Green Schools initiative, LEED for Schools, or similar rating systems within the designs for new school buildings and administrative facilities.	Ongoing	Community and Economic Development; SJUSD

*Related General Plan policy: Policy 41.4*

## ENERGY EFFICIENCY AND CONSERVATION: MUNICIPAL



Measure 4-5.A: Collaborate with SMUD to increase the use of green energy within City facilities.

The City will partner with SMUD and other organizations (including private businesses) to increase the ratio of renewable energy content in the energy used by public buildings and facilities. The City has already been proactive by installing solar panels on public buildings, such as on the roofs of the Community Center (65 kilowatt-hour [Kwh] panels producing 23,922 Kwh/yr) and City Hall (32Kwh panels producing 11,680 Kwh of electricity annually). However, these systems alone cannot provide for the full energy demand of the buildings. Therefore, to maximize the use of renewable energy in City operations, the City will purchase a portion of remaining energy needed from SMUD through the Greenergy program.

Pursuant to the State's Renewable Portfolio Standard requirements, SMUD purchases power generated from renewable resources, such as wind energy, solar energy and biomass. By supporting SMUD's Greenergy program, the City will reduce its GHG emissions. The City's participation in the Greenergy program also provides a leadership example for the community to follow, thereby influencing the community's overall power source choice and influence.

The City will partner with SMUD to conduct an energy audit to determine its baseline energy use and increase its purchases from SMUD's Greenergy program to the full amount of energy required that is not generated by the City's solar facilities. The City will also help SMUD identify locations within the community suitable for installation of utility-scale renewable energy generators.

### GHG Reduction Potential:

10 MT CO<sub>2</sub>e/yr  
(Based on capacity of existing solar panels)

### Community Co-Benefits:

Lead by example

Cost to City

Very Low

Cost to resident/  
business owner

NA

Savings to resident/  
business owner

NA



Installation of solar panels on General Services Department building in 2010.

### Did you know? COOL FACT

According to the California Energy Commission, "California's building efficiency standards (along with those for energy efficient appliances) have saved more than \$56 billion in electricity and natural gas costs since 1978. It is estimated the standards will save an additional \$23 billion by 2013."

Actions	Implementation Target	Responsible Party
A. Install cost-effective renewable energy systems on City buildings and City-funded facilities and purchase a portion of remaining electricity from SMUD's Greenergy program.	Before December 31, 2013	General Services
B. Collaborate with SMUD to determine if there is a suitable location (within or outside the City) for installation of a utility-scale solar facility.	Before December 31, 2016	General Services

Related General Plan policies: Policy 41.5



Measure 4-5.B: Reduce energy consumption in City buildings by 40% from baseline.

The City will partner with SMUD to conduct a comprehensive energy audit to determine baseline energy use in all City buildings. In collaboration with SMUD and other organizations, the City will develop a plan to reduce municipal energy consumption by 40% from the established baseline by 2020.

Citrus Heights has both old and new public buildings. An audit can help the City determine which facilities are most inefficient. Retrofitting inefficient facilities to meet modern energy efficiency standards will reduce operations and maintenance costs. This can release money from maintenance budgets to be used for other community enhancement projects.

A potential action item to achieve targeted reductions in energy use is switching from old inefficient equipment and appliances to newer Energy Star office systems. For example, if 100 computers and monitors, 20 printers, and 10 copiers used by the City are replaced with Energy Star appliances, the City could potentially save 14.1 MT CO<sub>2</sub>e/year.

## GHG Reduction Potential:

215 MT CO<sub>2</sub>e/yr

## Community Co-Benefits:

Lower municipal operating cost

## Cost to City

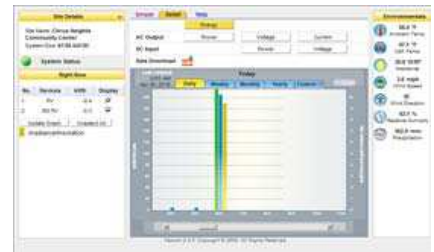
Medium

## Cost to resident/business owner

NA

## Savings to resident/business owner

NA



The Community Center's web page tracks the hourly amount of solar energy generated from rooftop photovoltaic panels.

## Did you know? COOL FACT

Efficient computer monitors use 20-60% less energy than traditional monitors, and efficient printers use about 37% less energy than conventional printers. An Energy Star water cooler uses about half the energy of a traditional one, resulting in about \$47 (hot water) and \$12 (cold water) savings per year.

Actions	Implementation Target	Responsible Party
A. Conduct an Investment-Grade Audit of City buildings and facilities and employ energy conservation practices to reduce consumption.	Before December 31, 2012	General Services
B. Install building energy performance data displays in City Hall.	Before December 31, 2013	General Services
C. Upgrade office equipment and appliances to Energy Star systems.	Before December 31, 2020	General Services

## Notes and References

In 2007, the City used 4,364,487 kWh of electricity and 17,583 therms of gas.

Related General Plan policy: Policy 41.5



Measure 4-5.C: Improve lighting efficiency and decrease energy consumption in public spaces.

Street lights and traffic lights are a big part of the City's operations and maintenance costs. City lights bring streets to life at night and address community safety concerns. A well-lit public street enhances the public image of the community. Functioning traffic lights are equally important to maintain smooth traffic flow within the City. Citrus Heights maintains 4,179 streetlights and 64 traffic lights. These lights use a considerable amount of energy and create GHG emissions. In 2002, the City converted all their traffic signals to LED lights.

Developing a lighting efficiency program will enable the City to reduce its GHG emissions and operating expenses. Using renewable energy sources or light-emitting diodes (LED) to replace conventional lighting promotes good practices within the community through instant, real-time applications.

## GHG Reduction Potential:

544 MT CO<sub>2</sub>e/yr  
(Street lights)

## Community Co-Benefits:

Reduced municipal  
operation costs,  
improved public spaces

## Cost to City

Low

## Cost to resident/ business owner

NA

## Savings to resident/ business owner

NA



Solar-powered lighting provides a renewable alternative to light City streets.

## Did you know? COOL FACT

In January 2010, the City completed the corridor of Greenback Lane project, converting 256 street lights with LED street and safety lighting. All 64 traffic signals in the City have also been converted to LED lights.

- City of Citrus Heights

Actions	Implementation Target	Responsible Party
A. Convert all street and traffic lights to LED bulbs or LED-Solar combined systems	Before December 31, 2016	General Services
B. Install high-efficiency lighting in all City-owned or funded facilities.	Before December 31, 2013	General Services

Related General Plan policy: Policy 41.5



# **WATER EFFICIENCY AND CONSERVATION**

Water-related GHG emissions are mainly caused by energy use required to pump, transport, heat, cool and treat water and wastewater. In a dry climate, water demand and resulting emissions are magnified due to a relative shortage of water sources including decreased Sierra snowpack which affects water levels in Folsom Lake. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. About 6.3% of the Citrus Heights' communitywide emissions are related to water use.

The City will work with water purveyors (Citrus Heights Water District, California American Water Company, and Sacramento Suburban Water District) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.



## WATER EFFICIENCY AND CONSERVATION: SOURCE REDUCTION



Measure 5-1.A: Work with the water agencies to develop plans to implement SB 7 to achieve a 20% reduction in urban water demand by 2020.

The California legislature adopted SB 7 in 2009, requiring the Department of Water Resources (DWR) to reduce statewide per capita water use by 20% by 2020. Over the next decade, DWR will be working with water agencies throughout the state to establish water conservation targets and provide guidance to meet urban water per capita reductions of 10% by 2015 and 20% by 2020.

Citrus Heights residents and businesses receive water from three different entities, Citrus Heights Water District, California American Water Company, and Sacramento Suburban Water District. The City will collaborate with the three water providers to identify specific water conservation measures for their urban water management plans to meet the SB 7 reduction goal. Implementation strategies will include demand management programs, installation of high-efficiency plumbing fixtures, and alternatives to potable water sources.

### **GHG Reduction Potential:**

*4,030 MT CO<sub>2</sub>e/yr*

### **Community Co-Benefits:**

*Reduced energy demand*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Reduce potable water demand and waste.

### **Did you know? COOL TIP**

It takes a lot of energy to heat water. By installing a low flow showerhead 350 pounds of carbon dioxide can be saved per year and by washing your clothes in cold or warm water another 500 pounds of emissions can be avoided per year.

- [globalwarming-facts.info/50-tips.html](http://globalwarming-facts.info/50-tips.html)

Actions	Implementation Target	Responsible Party
A. Coordinate with water agencies to conduct focused public outreach that promotes water conservation practices required for a Stage 2 Water Alert scenario.	Before December 31, 2012	General Services
B. Encourage water districts to provide rebates in partnership with the Sacramento Metropolitan Utility District (SMUD) (Ultra-low Flush toilets program, High-efficiency Clothes Washer Program) to residents and businesses as an incentive to upgrade their water appliances with higher-efficiency features.	Ongoing	General Services
C. Promote availability of water-efficient products and fixtures at local stores.	Before December 31, 2011	General Services; Community and Economic Development

### Notes and References

*This is the primary measure within the Water Efficiency and Conservation strategy. Other measures within this strategy are supporting measures and have not been quantified individually. All of the recommended water conservation measures will collectively contribute to meeting the State's 2020 water conservation goal.*

*Related General Plan policies: Policy 4.5, Policy 37.2, Policy 55.1, Policy 62.1, Policy 62.4*

## WATER EFFICIENCY AND CONSERVATION : SOURCE REDUCTION



**Measure 5-1.B:** Continue to provide a free irrigation review program for residential and commercial buildings and implement a monitoring plan to evaluate if program users are effectively using the irrigation review report to reduce water demand by 20%.

Landscape irrigation is one of the biggest uses of potable water in the City. Citrus Heights consists mostly of low-density residential uses with relatively large landscaped areas. Therefore, it is important for the City to influence plant choices and maintenance practices within these areas. Using low-water and low-maintenance plants in landscaped areas can reduce irrigation water demand.

Citrus Heights Water District already provides free irrigation review for its customers. The City will work proactively with the other water service providers to provide similar irrigation review services to their customers. The irrigation review audits a customer's current irrigation practices and provides recommendations on ways to reduce water demand. Since most customers in the City have water meters, following these recommendations can also reduce water bills.

Expanding the free irrigation review program to all Citrus Heights residents and businesses can also help the water districts meet their SB 7 reduction goals by 2020.

### **GHG Reduction Potential:**

*(Included in Water Efficiency and Conservation Measure 5-1.A)*

### **Community Co-Benefits:**

*Reduced energy demand, improved public spaces*

### **Cost to City**

*Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*Very Low*

*(recurring savings)*



Drip irrigation systems use less water than spray systems.

### **Did you know? COOL TIP**

A good rule of thumb for deciding on an appropriate watering system is that the larger the water drop delivered, and the closer to the ground, the better it is. Studies show hand-held hose watering methods use almost 33% less water than average household automated sprinkler systems.

- [www.landscapingstory.com/Landscaping-Water-Efficiency](http://www.landscapingstory.com/Landscaping-Water-Efficiency)

Actions	Implementation Target	Responsible Party
A. Partner with the water districts to develop and promote free irrigation review programs.	Before December 31, 2013	Community and Economic Development; General Services
B. Work with water districts to develop a monitoring and reporting plan as part of the irrigation review program to evaluate successful implementation of audit recommendations.	Before December 31, 2013	Community and Economic Development
C. Work with water districts to expand the irrigation review program to commercial building owners.	Before December 31, 2013	Community and Economic Development
D. Work with water districts to create a water waste patrol program to allow residents and businesses to report misuse and waste of irrigation water (such as watering during rains, water spilling outside landscaped areas, etc.)	Before December 31, 2012	Community and Economic Development
E. Create a communitywide policy to reduce turf installation.	Before December 31, 2012	Community and Economic Development

*Related General Plan policies: Policy 37.1, Policy 37.2, Policy 37.3*

## WATER EFFICIENCY AND CONSERVATION : SOURCE REDUCTION



Measure 5-1.C: Adopt a landscape ordinance for new development, consistent with Department of Water Resources guidance.

In 2006, the California legislature adopted AB 1881, requiring the Department of Water Resources (DWR) to develop a model landscape ordinance for local jurisdictions to achieve water use reductions in outdoor irrigation. DWR completed the model landscape ordinance in 2009. In 2010, California local jurisdictions were required to either adopt DWR's model ordinance or a locally adapted version that is at least as effective. Citrus Heights is adopting a landscape ordinance that complies with Department of Water Resources guidelines.

Consistent with AB 1881 requirements, Citrus Heights' landscape ordinance will require the following for both public and private landscaping:

- Low water plant choices
- Grouping compatible plants into hydrozones
- Irrigation water budgets
- Use of efficient irrigation systems, including sensors and automatic controllers
- Soil assessment and soil management
- Post-installation inspection and maintenance
- Preparation of landscape documentation packages, as appropriate
- Limited exemptions

### GHG Reduction Potential:

*(Included in Water Efficiency and Conservation Measure 5-1.A)*

### Community Co-Benefits:

Improved *public spaces*

### Cost to City

*Very Low*

### Cost to resident/ business owner

*NA*

### Savings to resident/ business owner

*NA*



Choosing water-conserving landscaping for front yards and public rights-of-way reduces communitywide water demand.

### Did you know? COOL FACT

CIMIS is an integrated network of 121 computerized weather stations located in many areas of California, like Davis, Fresno, and Red Bluff that provides weather information needed to calculate water budgets and improve landscape water efficiency.

Actions	Implementation Target	Responsible Party
A. Conduct outreach to home and business owners to join the computerized California Irrigation Management Information System (CIMIS) for irrigation schedule analysis.	Before December 31, 2012	Water providers; Community and Economic Development
B. Develop a climate-appropriate native plant list to encourage residents and businesses to use low-water and low-maintenance plants in their yards.	Before December 31, 2011	Community and Economic Development
C. Promote availability of water efficient and climate appropriate plants at local nurseries and home improvement stores.	Ongoing	Community and Economic Development

### Notes and References

*The real challenge in implementing the landscape ordinance is to enforce guidelines in existing development. It is anticipated that Citrus Heights will have limited new development in future. However, majority of the existing development landscapes do not comply with the AB1881 requirements. The City will need to proactively partner with water agencies to conduct public outreach to promote water conserving and low-maintenance landscapes in order to have a meaningful impact in relation to overall community irrigation use. This is necessary to meet the water conservation goals of SB 7.*

*Related General Plan policies: Policy 34.2, Policy 62.4*



## WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES



**Measure 5-2.A:** Work with the water agencies to investigate potential for a gray water and rainwater collection program to encourage use of systems in new residential and commercial uses.

The Sacramento region has faced drought conditions in each of the past three years. As our climate changes, it is anticipated that the region may receive variable precipitation resulting in extended droughts or more frequent intense storms. This pattern will directly affect the water sources in the region. Therefore, as an adaptation strategy, Citrus Heights will evaluate the potential use of rainwater and graywater as alternative water sources.

Rainwater collection is popularly accepted in the state. Building rain gardens in residential backyards can help to collect the first showers and delay site runoff by allowing on-site infiltration and ground water recharge. Rain gardens built using native landscape plants and materials can also provide a natural household amenity and habitat area attracting native birds and insects.

Graywater is composed of all the non-toilet wastewater generated in an average household from bathtubs, showers, sinks (except from garbage disposal), washing machines and dishwashers. Typically, water generated from these sources can be easily treated and reused for flushing or irrigation purposes. Since graywater requires basic treatment before reuse, it has still not become widely accepted. However, with increasingly limited water resources, the City may investigate the potential of graywater reuse in new residential and commercial properties.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Habitat restoration,  
improved public spaces*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Having a rainwater garden in the backyard can improve water quality.

### **Did you know? COOL FACT**

A 2006 study showed that graywater constitutes 50% of the total wastewater generated within a household. At an average of 90 gallons produced each day, it is sufficient to irrigate about one-half the yard of a 2,500 sq.ft home on quarter-acre lot if xeriscaping is used.

- [www.urbanwater.colostate.edu](http://www.urbanwater.colostate.edu)

Actions	Implementation Target	Responsible Party
A. Seek grants to provide financial incentives and technological assistance to encourage homeowners to build rain gardens.	Ongoing	Community and Economic Development
B. Revise the Zoning and Building codes to allow and promote use of rainwater collection consistent with state law.	Before December 31, 2013	Community and Economic Development
C. Work with adjacent cities and water providers to promote statewide and communitywide acceptance of graywater as an alternative water source.	Before December 31, 2014	Community and Economic Development

*Related General Plan policies: Policy 55.1, Policy 62.7*

## WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES

Measure 5-2.B: Develop an outreach program to educate residents and business owners on ways to minimize wastewater generation and reuse techniques.



The City will conduct focused workshops with residents and businesses to guide them on how to minimize wastewater generation in their facilities. All the wastewater generated within the City is treated at the Sacramento Regional Wastewater Treatment Plant. Currently, there is enough capacity at the plant to treat all of the community's wastewater. However, as the City explores a comprehensive water management plan, one of the goals will be to partner with Sacramento County Sanitation District (SCRSD) to minimize wastewater generation. Energy used to treat wastewater creates GHG emissions. Minimizing the community's wastewater generation, can effectively reduce Citrus Heights' contributions to GHG emissions.

Using public outreach methods to educate residents and business will help to achieve the intent of this measure.

### **GHG Reduction Potential:**

*(Included in Water Efficiency and Conservation Measure 5-1.A)*

### **Community Co-Benefits:**

*Reduced energy demand, increased funding options*

### **Cost to City**

*Low*

### **Cost to resident/business owner**

*NA*

### **Savings to resident/business owner**

*NA*



"Purple pipe" reclaimed water can be used for household purposes that do not require drinking water quality.

### **Did you know? COOL TIP**

Top 5 water conservation actions at home:

1. Stop leaks that can account for 10% water loss indoors and up to 75% water loss outdoors.
  2. Replace toilets installed before 1992, or using 1.6 gallons of water per flush.
  3. Upgrade old washing machines to Energy Star appliances.
  4. Use low-water landscape plants.
  5. Water only when your plants need.
- <http://www.h2ouse.net/>

Actions	Implementation Target	Responsible Party
A. Partner with SCRSD to develop focused workshops for large wastewater generators, such as multi-family and commercial uses and provide education about ways to reduce wastewater generation and reuse water.	Before December 31, 2012	General Services
B. Partner with SCRSD to provide technical assistance to community members regarding installation of fixtures that reuse wastewater.	Ongoing	General Services

*Related General Plan policies: Policy 62.4, Policy 62.6, Policy 62.7*



# WATER EFFICIENCY AND CONSERVATION: ALTERNATIVE SOURCES



Measure 5-2.C: Develop water-sensitive urban design guidelines for new construction and retrofit of existing urban environment.

Water Sensitive Urban Design (WSUD) goes beyond typical low impact development (LID) strategies that largely focus on stormwater. WSUD integrates practices that relate to the complete water cycle in urban areas. The three primary principles of a WSUD strategy include:

- Potable water demand management
- Wastewater source reduction
- Stormwater management

By developing WSUD guidelines specific to Citrus Heights, the City can guide new development and redevelopment during the early design stages to integrate design features that enhance overall water quality. Integrating natural water retention, reuse and infiltration within project sites will help to reduce infrastructure costs related to water, sewer and stormwater pipe sizes. As a co-benefit, community water quality will also be improved by eliminating polluted urban water flows into natural drainages and habitat areas.

## GHG Reduction Potential:

*Supporting measure*

## Community Co-Benefits:

*Habitat restoration,  
improved public spaces*

## Cost to City

*Low*

## Cost to resident/ business owner

*Medium – High*

## Savings to resident/ business owner

*NA*



Installing parking medians with low-water plants provides important water quality benefits.

## Did you know? COOL TIP

Where to locate a rain garden at home:

- At least 10 feet away from the house so infiltrating water doesn't seep into the foundation;
- Away from septic tanks, underground wells and utilities;
- In full or partial sun avoiding complete shade under big trees;
- Not in a part of the yard that already ponds as it will slow infiltration.

Actions	Implementation Target	Responsible Party
A. Amend the Zoning Code to require new projects and substantial renovations to implement site designs that promote infiltration, reuse, and evapotranspiration of rainfall from impervious areas.	Before December 31, 2012	Community and Economic Development
B. Incorporate vegetated swales and/or bioretention swales in public rights-of way (e.g., traffic islands, centers of cul-de-sacs, landscaped strips along sidewalks, bulb-outs, parking separators).	Ongoing	Community and Economic Development; General Services
C. Modify City codes and ordinances to minimize impervious surfaces throughout the City.	Before December 31, 2012	General Services

## Notes and References

*WSUD concepts and practices originated in Australia. However, the concept of whole water cycle management is becoming more popular in the United States as communities strive to adapt to the changing climate that affects natural water resources. WSUD strategies are especially effective in drought-prone areas or areas with intense seasonal storms that may cause flooding. Through a whole-systems approach, WSUD guidelines help to maintain water balance and aquatic health.*

*Related General Plan policies: Policy 34.1, Policy 37.1, Policy 37.3, Policy 49.1*

## WATER EFFICIENCY AND CONSERVATION: MUNICIPAL



Measure 5-4.A: Reduce municipal landscape irrigation water consumption by 50% by 2020.

Landscape irrigation water consumption can burden the City's operations and maintenance costs.

In partnership with the water providers, the City will audit the baseline annual water consumption related to irrigation of city-owned facilities. Following the audit, the City will develop a plan to reduce irrigation water consumption by 50% through various measures including low-water planting, climate-appropriate irrigation scheduling and replacing old inefficient irrigators with new high-efficiency systems.

### **GHG Reduction Potential:**

< 1 MT CO<sub>2</sub>e/ yr

### **Community Co-Benefits:**

*Improved public spaces*

### **Cost to City**

*High*

### **Cost to resident/ business owner**

NA

### **Savings to resident/ business owner**

NA



A water-conserving landscape in front of the City's Police Service Center.

### **Did you know? COOL FACT**

According to US Environmental Protection Agency, typical office water use consists of:

- 40% for sanitary uses;
- 26% for heating and cooling;
- **22% for irrigation;**
- 1% for single pass cooling;
- 1% for kitchen uses;
- and remaining for other miscellaneous use.

Actions	Implementation Target	Responsible Party
A. Conduct an irrigation review for all municipal facilities, in partnership with CHWD.	Before December 31, 2012	General Services; Water providers
B. Develop and implement a water conservation plan for all municipal facilities based on the irrigation audit findings.	Before July 31, 2013	General Services

*Related General Plan policies: Policy 55.1, Policy 62.1*



Measure 5-4.B: Reduce municipal potable water consumption by 40% by 2020.

Citrus Heights has few public buildings, but they all use potable water. City Hall completed a water audit in 2004. However, other City facilities have not been audited.

The City will conduct a water audit of its facilities to determine a baseline municipal water consumption rate. While some public buildings, such as the Community Center, have been recently built, it is also important to create an inventory of the types of plumbing fixtures being used in older facilities. Over the last decade, plumbing fixtures have increasingly become more efficient. By replacing old systems with new high-efficiency systems, the City can reduce its potable water consumption.

Following the audit, the City will develop a water conservation plan designed to achieve a 40% reduction in potable water consumption from 2007 levels by 2020.

## **GHG Reduction Potential:**

*(Included in Water Efficiency and Conservation Measure 5-4.A)*

## **Community Co-Benefits:**

*Reduced energy demand*

## **Cost to City**

*High*

## **Cost to resident/business owner**

*NA*

## **Savings to resident/business owner**

*NA*



Upgrading to new efficient plumbing fixtures helps reduce water consumption.

## **Did you know? COOL FACT**

A low-flow toilet uses 1.6 gallons of water per flush as compared to a high-efficiency toilet (HET) using only 1.2 gallons of water per flush. Using a high efficiency unit can save up to 8,760 gallons of water each year for a family of four with average daily flushes of six each. This allows for a 20% reduction in water use from low-flow toilets.

Actions	Implementation Target	Responsible Party
A. Conduct a water audit for all municipal buildings and operations, in partnership with CHWD.	Before December 31, 2012	General Services; Citrus Heights Water District
B. Develop and implement a water conservation plan for all municipal facilities based on the water audit findings.	Before June 30, 2013	General Services

*Related General Plan policies: Policy 55.1, Policy 62.1*

## WATER EFFICIENCY AND CONSERVATION: MUNICIPAL



**Measure 5-4.C:** Convert 25% of impervious parking surfaces on City-owned properties to permeable parking surfaces.

Impervious parking surfaces are abundant in Citrus Heights. The City will identify total impervious parking surfaces on City-owned properties and convert 25% of them to permeable surfaces by 2020. This will demonstrate the City's commitment to enhance both water quality and the built environment within the community.

Impervious surfaces, such as asphalt parking areas, do not allow water to infiltrate into the ground and create increased stormwater runoff. Runoff from parking sites is usually polluted by vehicle oil spills. Polluted runoff is ultimately carried to the City's creeks and natural drainage systems. By supporting permeable paving on City-owned properties, the City will promote the benefits of permeable paving as a Best Management Practice to reduce runoff and control water pollution.

Depending on the amount of water collected through the permeable parking surfaces, this strategy can also reduce the City's non-potable water demand if the collected water can be reused for other activities such as landscape irrigation, or cleaning City vehicles.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Reduced urban heat island effect,  
improved public spaces*

### **Cost to City**

*High*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Permeable surfaces allow for groundwater recharge and reduce stormwater runoff.

### **Did you know? COOL FACT**

Based on research in the City of Olympia, Washington, parking lots typically account for 53% of impervious area in commercial sites and 15% on multi-family sites. Therefore, careful design can go a long way to protect community water resources.

Actions	Implementation Target	Responsible Party
A. Develop a plan to convert 25% of total parking surfaces on City-owned properties to permeable paving surfaces.	Before June 30, 2014	General Services

*Related General Plan policies: Policy 55.1, Policy 62.1*



# WASTE REDUCTION AND DIVERSION

Waste-related GHG emissions result from the type of products we consume within our daily lives and how we dispose of them as well as from pre-consumer commercial and industrial processes. In Citrus Heights, nearly 4.4% of GHG emissions are associated with solid waste generation and disposal in landfills. Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper, and wood) is buried in landfills and anaerobic digestion takes place, emitting methane, a potent GHG, as a by-product of the digestive process. Additionally, extracting and processing raw materials for consumer products, distributing them to consumers and disposing of them creates a large portion of global GHG emissions.

The City currently contracts with Allied Waste Systems to provide residential waste collection and recycling. For commercial waste-related services, the City uses private commercial haulers. The City recognizes that, due to limited remaining landfill space in Northern California, disposing solid waste will become more expensive as communities oppose the expansion and creation of new landfills adjacent to populated areas. Presently, most waste reduction practices focus on diverting waste products from landfills through recycling strategies. However, it is also important to consider programs that reduce overall waste generation, and to first consider reuse options.

As consumers of goods and services, we all generate waste and related GHG emissions. Our choices regarding products, packaging and consumption determine our personal contributions to community waste generation. Lowering our consumption and buying climate-friendly, durable products with minimal packaging can substantially reduce our personal GHG emissions, and in the process can reduce community waste generation.



## WASTE REDUCTION: SOURCE REDUCTION



**Measure 6-1.A:** Establish a 2020 waste reduction target of 75% below 2005 levels and work with the County, neighboring cities and other organizations to create a low-waste plan and provide public education regarding low-waste strategies and implementation.

The 1989 California Integrated Waste Management Act (AB 939) required cities to reduce their waste stream to landfills by 50% by the year 2000. Senate Bill (SB) 1016 (2010) requires the City to adopt a per capita annual disposal rate. The City will increase its reduction and diversion target for 2020 to 75% relative to 2005 waste generation levels.

Prior to SB 1016, the City's target had been to achieve at least 1.6% of the 50% diversion required by AB 939 through waste source reduction programs. With the new SB 1016 method for quantifying waste diversion, the City will need to increase its current source reduction efforts. The actions below identify areas where the City has maximum opportunity to effect waste reduction programs.

### **GHG Reduction Potential:**

*18,880 MT CO<sub>2</sub>e/ year*

### **Community Co-Benefits:**

*Improved air quality*

### **Cost to City**

*Medium*

### **Cost to resident/ business owner**

*NA*

### **Savings to resident/ business owner**

*NA*



Reducing waste disposed at landfills can reduce emissions of methane, a potent greenhouse gas.

### **Did you know? COOL FACT**

After AB 939 was enacted in 1989, one major office building in Los Angeles managed a 75% recycling of waste paper saving 2,000 tons of waste paper. The effort also saved 32,760 trees, 69 million gallons of water and 4,450 barrels of oil. Los Angeles also gained 3,800 cubic yards of precious landfill space.  
- Los Angeles Business Journal, 1991

<b>Actions</b>	<b>Implementation Target</b>	<b>Responsible Party</b>
A. Create a comprehensive source reduction plan for the community to assist residents, businesses and schools to decrease per capita waste generation.	Before December 31, 2013	General Services
B. Develop a junk-mail prevention outreach program that helps residents to voluntarily opt out of receiving junk mail.	Before December 31, 2012	General Services
C. Provide incentives (such as continue tiered rates and award programs) for increased participation in homeowner and business owner recycling programs.	Before December 31, 2012	General Services
D. Conduct waste-reduction consultations with major waste generators (businesses and multi-family) and recommend strategies to reduce waste and increase recycling while reducing business cost.	Before December 31, 2013	General Services
E. Consider the feasibility of a ban on use of plastic water bottles.	Before December 31, 2013	General Services
F. Create a comprehensive yard waste-to-mulch program and require commercial tree companies to use all tree waste as mulch.	Before December 31, 2013	General Services

### **Notes and References**

*The City currently contracts with private companies for solid waste collection and recycling services. The City will partner with the private waste service company and commercial haulers to create a comprehensive communitywide waste reduction strategy.*

*Related General Plan policies: Policy 51.1, Policy 51.3, Policy 63.1, Policy 63.2, Policy 63.1, Policy 63.4*

## WASTE REDUCTION: DIVERSION



Measure 6-1.B: Increase recycling and composting programs to divert waste from landfills.

Citrus Heights provides recycling services through private residential and commercial waste collectors. Based on the AB 939 50% diversion requirement, Citrus Heights' goal has been to achieve at least 27% of the total diversion through recycling. However, pursuant to SB 1016, the City will need to identify new diversion programs to successfully meet the lower per capita waste disposal rate.

One of the City's target areas will be to identify ways to manage construction waste. Although the real estate market has been slow, the City has ongoing construction projects associated with street and landscaping improvements, and can anticipate future development. Therefore, a key step is to adopt a construction and demolition program to guide how the community should salvage, recycle and divert construction waste from landfills.

Another target area is to explore composting options. The Sacramento County Waste Management and Recycling Division (SCWMRD) has been operating a Backyard Compost program for residences since 1991. The City can create more visibility and acceptance for this program through public outreach and education. Citrus Heights also has a large number of restaurants. Exploring food-to-composting programs within local restaurants can also help increase diversion of organic waste from landfills.

### GHG Reduction Potential:

(Included in Waste Reduction Measure 6-1.A)

### Community Co-Benefits:

Alternative energy source

### Cost to City

Very Low – Low

### Cost to resident/ business owner

NA

### Savings to resident/ business owner

NA



Compost bin for organic waste including food scraps and yard waste.

### Did you know? COOL FACT

The EPA estimates that 75% of what Americans throw in the trash could actually be recycled.

Recycling one aluminum can saves enough energy to run a TV for three hours — or the equivalent of a half gallon of gasoline.

Actions	Implementation Target	Responsible Party
A. Continue to aggressively pursue community recycling efforts by developing public awareness/outreach campaigns, promoting e-waste collection events, bulk and community clean-up projects, and distribution of recycling containers at bus stops.	Ongoing	General Services
B. Develop a communitywide hazardous waste collection and recycling program to address recycling of batteries, compact-fluorescent light (CFL) bulbs, and similar household hazardous waste.	Before December 31, 2013	General Services
C. Conduct a feasibility study to create a food-to-compost program for local businesses and residents.	Before December 31, 2013	General Services
D. Implement a construction and demolition program to require all designated recyclable materials be recycled or reused.	Before December 31, 2011	General Services

### Notes and References

*Some commercial haulers provide fluorescent lighting recycling services, but the City should actively seek ways to improve the efficiency of commercial fluorescent light recycling and expand such services for residential areas. Since one of the key GHG reduction measures within the energy sector is to replace incandescent bulbs with CFLs, the City will aggressively pursue recycling services for them. One of the community concerns for CFL use is disposal of the limited amount of mercury contained in the bulbs. However, a dedicated recycling service for CFLs will encourage increased participation in the light bulb replacement program.*

**Related General Plan policies: Policy 63.2, Policy 63.3, Policy 63.4, Policy 63.5, Policy 63.6, Policy 63.7**

## WASTE REDUCTION: MUNICIPAL



Measure 6-2.A: Implement a paperless office program for all feasible municipal operations.

Municipal activities generally require extensive record-keeping which consumes paper for copying and printing. However, the City can actively choose to go paperless and reduce its carbon footprint related to manufacture and use of paper for some activities and operations.

Some feasible municipal operations where the City can avoid using paper include billing and payment records, plan reviews, and maintaining digital copies of codes, rules and ordinances. One of the key concerns for municipal functions is to make City documents easily accessible to the community. Maximizing use of City's website can reduce paper waste generation.

The City will conduct an inventory of all municipal operations requiring paper use and adopt a policy to go paperless whenever feasible. This measure will help the City to lead by example by reducing municipal waste generation and contribute toward an effective communitywide waste source reduction. This will also help reduce municipal operations and maintenance costs.

### **GHG Reduction Potential:**

*Supporting measure*

### **Community Co-Benefits:**

*Reduced municipal operating costs*

### **Cost to City**

*Very Low*

### **Cost to resident/ business owner**

NA

### **Savings to resident/ business owner**

NA



Stacks of paper used for office record keeping.

### **Did you know? COOL FACT**

The EPA estimates that a typical business office generates about 1.5 pounds of waste paper per employee per day!

Actions	Implementation Target	Responsible Party
A. Work with utilities and public service providers to encourage paperless billing and payment options and other City functions.	Before December 31, 2012	City Clerk

*Related General Plan policies: Policy 55.2*



# GREEN INFRASTRUCTURE, PUBLIC HEALTH AND SAFETY

Green infrastructure consists of a wide variety of natural features that, when integrated within an urban environment, provide valuable ecosystem services to the community. In Citrus Heights, green infrastructure includes the urban forest, natural stormwater-absorbing landscapes, and community gardens. Green infrastructure benefits the City by reducing urban heat island effects, reducing building energy use, improving stormwater and waste management, and public health. The measures contained within this strategy describe green infrastructure improvements capable of reducing GHG emissions or removing and storing carbon from the atmosphere by physical and biological processes such as plant photosynthesis (a process known as *carbon sequestration*).

The City recognizes trees as a valuable asset. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, keep buildings cool in the summer, create privacy, and establish habitat for bird species. Importantly, the urban forest also captures and stores carbon as the trees grow.

Community gardens are plots of land that offer residents a place to grow food, flowers and other crops. The gardens increase residents' access to fresh produce, preserve urban green space, promote intergenerational and intercultural interaction, and provide an alternative form of recreation. The City of Citrus Heights has one community garden, located at Sylvan Road and Stock Ranch Road. Many additional potential community garden sites exist within the City.





**Measure 7-1.A:** Enhance the City's urban forest and other green infrastructure to reduce building energy use, improve comfort, augment neighborhood aesthetics, improve stormwater quality, and maximize carbon capture and storage.

The City will work to expand the community's green infrastructure through targeted investment, development of public/private partnerships, and outreach programs. In addition to reducing greenhouse gases and capturing and storing carbon, expanding the City's urban forest will produce a wide range of community benefits and improve residents' quality of life.

The City will develop an urban forestry program to establish design, planting and maintenance guidelines for trees located on public property and coordinate implementation among City departments.

To achieve the estimated GHG reductions, 1,500 new trees should be planted on public and private property within the community between 2010 and 2020. The City will set a goal to plant 150 new trees per year during this 10-year timeframe. Outreach to property owners and neighborhood organizations and partnerships with non-profits will be important components in achieving this target.

## **GHG Reduction Potential:**

*110 MT CO<sub>2</sub>e/ yr  
(building energy savings)*

*630 MT CO<sub>2</sub>e/ yr  
(carbon capture and storage)*

## **Community Benefits:**

*Improved public spaces,  
lower energy bills,  
improved air quality*

## **Cost to City**

*Low – Medium*

## **Cost to resident/ business owner**

*Low – Medium*

## **Savings to resident/ business owner**

*Very Low*



Mature shade trees in neighborhoods enhance community character.

## **Did you know? COOL FACT**

One tree can reduce energy consumption by around 200 kilowatthours per year for a home located in California's Central Valley. If 1,000 households planted shade trees, the energy savings would reduce about 84 metric tons of GHGs per year, the equivalent of taking 70 cars off the road.  
- Center for Urban Forest Research

Actions	Implementation Target	Responsible Party
A. Conduct a public tree inventory and canopy coverage analysis to determine best opportunities to improve the urban forest.	Before June 30, 2012	General Services; Sunrise Recreation and Park District
B. Develop an Urban Forest Management Plan.	Before December 31, 2014	General Services; Community and Economic Development
C. Develop an outreach program to provide community information about the benefits of urban forestry and other green infrastructure.	Before December 31, 2011	Community and Economic Development; Sunrise Recreation and Park District
D. Partner with local businesses, non-profit groups and agencies (e.g., SMUD's Shade Tree Program) to provide incentives to plant trees and install green roofs on private property.	Ongoing through 2020	Community and Economic Development
E. Create a specific fund for urban forest and green infrastructure public improvements within the capital improvement plan.	Before December 31, 2012	General Services
F. Consider undergrounding utility lines in areas where utility lines inhibit street tree growth.	Ongoing	General Services

*Related General Plan policies: Policy 7.3, Policy 34.2, Policy 36.1, Policy 36.2, Policy 60.1*





**Measure 7-2.A:** Expand the community garden program to increase local food security and provide local recreation opportunities.

The City will work to increase the number of community gardens available to residents. Successful community gardens require defined management policies and high levels of community engagement.

The City of Citrus Heights has one community garden within its limits, located at Sylvan Road and Stock Ranch Road. The City encourages identification of additional potential sites for community gardens. Priority will be given to locations near residential areas with interest in urban food production. Both public and vacant private land offered by willing landowners will be considered for garden development.

The City will identify and remove zoning barriers preventing additional community gardens or farmers markets.

## **GHG Reduction Potential:**

*Supporting measure*

## **Community Benefits:**

*Increased recreation choices,  
better access to local food,  
improved public health*

## **Cost to City**

*Very Low*

## **Cost to resident/ business owner**

*NA*

## **Savings to resident/ business owner**

*NA*



A community garden can grow flowers, vegetables or community.

## **Did you know? COOL FACT**

Based on a study done by California Healthy Cities, a school in West Hollywood demonstrated a 6% increase in physical activity and 10% increase in consumption of fruits and vegetables per day among 338 participants in the school's community gardening program.

Actions	Implementation Target	Responsible Party
A. Conduct an audit of existing codes to identify and remove any barriers to developing or operating community gardens.	Before June 30, 2012	Community and Economic Development
B. Promote community involvement in the existing Sylvan Road community garden and determine public interest regarding future community gardens.	Ongoing	Community and Economic Development; Sunrise Recreation and Park District
C. Consider support of community gardens and farmers markets along with necessary infrastructure and management policies.	Ongoing through 2020	Community and Economic Development; General Services; Sunrise Recreation and Park District

*Related General Plan policies: Policy 45.1, Policy 47.1, Policy 60.2*

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## CHAPTER

# 4

# CONCLUSION

The City of Citrus Heights Greenhouse Gas Reduction Program (GGRP) recommends 19 *primary* measures that allow the City to meet its communitywide greenhouse gas (GHG) emission reduction target for 2020. *Supporting* measures described in the GGRP do not affect attainment of the target directly, but many do contribute to the performance of the *primary* measures. The recommended measures are capable of achieving a 13.7% reduction from baseline 2005 GHG emission levels by 2020. In addition to reducing GHG emissions in the community, the measures described in this plan also improve overall quality of life in the community.

If GHG reductions anticipated from statewide implementation of AB 1493 and Low Carbon Fuel Standards (LCFS) are considered, the combined effect of the City's GHG reduction measures and these statewide actions would be a 24.5% reduction from 2005 levels. While statewide reductions alone are nearly sufficient to achieve the City's target, their effects are not certain, and implementing them is an action beyond the City's control. The City accepts that it has a fair share responsibility to implement GHG reduction measures addressing communitywide emissions within its control, above and beyond statewide reductions. Thus, the recommended GGRP measures outline a path to achieving the GHG reduction target without relying on statewide reductions.

To monitor effectiveness of the measures in reducing GHG emissions, the City has identified indicators that will be used to demonstrate progress and performance of the plan relative to the reduction target on an annual basis, in conjunction with the State-required annual report to City Council on progress implementing the General Plan. This regular check-in will also allow the plan to be modified and new measures considered if necessary in the future.

The GGRP favors incentive-based approaches to reducing GHG emissions, as opposed to regulatory mandates. The intent of these approaches is to promote high levels of community participation and, working with stakeholders and utilities, to provide adequate incentives to achieve emission reductions. This approach also considers the fact that the City is largely built out, so that opportunities to achieve communitywide GHG reductions by imposing conditions of approval on new development are limited. After at least three annual monitoring reports, staff shall prepare a report analyzing whether the GGRP is on track to achieve the reduction target. If the report concludes the GGRP is not on track to achieve the reduction target, the

## Chapter 4 – Conclusion

report shall include recommendations regarding potential new or revised measures to: a) encourage more aggressive implementation, b) include new and/or modified non-binding measures, and/or c) modify certain non-binding measures to be mandatory if supported by available funding and technical assistance. The report shall also consider updated guidance that has been provided by agencies or working groups in the region with respect to such measures.

Additionally, within three months of adoption of the GGRP, the City will develop a checklist of potential mitigation measures based on mandatory and non-binding GGRP measures. The City will use this checklist in evaluating applications for discretionary entitlements in accordance with CEQA Guidelines Section 15183.5.

Table 4-1 identifies progress indicators to be used in monitoring implementation and reduction effectiveness of the recommended *primary* measures.

**Table 4-1**  
**GHG Reduction Measures and Progress Indicators**

Measure		GHG Reduction Potential (MT CO <sub>2</sub> e)	Progress Indicators	Target Year
Transportation and Connectivity				
Measure 3-2.A	Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.	1,230	i. 1% increase in rideshare mode from 2005.	by 2015
			ii. 2% increase in rideshare mode from 2005.	by 2020
Measure 3-4.A	Create infrastructure to promote use of low-carbon and alternative fuel vehicles.	12,210	i. Install 700 new electric charging stations.	by 2020
			ii. 1,500 new hybrid vehicles purchased within in the community	
			iii. 1,500 new electric vehicles purchased within the community	
Measure 3-5.A	Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.	3,730	i. 1.5% increase in bike + pedestrian mode from 2005.	by 2020
Measure 3-6.A	Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.	2,490	i. 1% increase in transit mode from 2005.	by 2020
Measure 3-7.A	Improve fuel-efficiency of the City fleet by purchasing low or zero-emission vehicles when vehicles are retired from service. (Public safety vehicles are exempted from this requirement.)	40	i. 5 existing City vehicles replaced by hybrids.	by 2018
Measure 3-7.B	Provide financial incentives to encourage ridesharing and/or public transit use among City employees.	60	i. 8.5% reduction in employee commute trips based on flexible timing, rideshare programs.	by 2010
SUBTOTAL		19,760		
Energy Efficiency and Renewable Energy				
Measure 4-2.B	Collaborate with utility companies to provide financial incentives/rebates for residential and commercial buildings to upgrade from inefficient water heaters to solar water heaters.	8,670	i. 30% of total residential (new and existing) units install solar water heaters.	by 2020
			ii. 20% of total commercial (new and existing) properties install solar water heaters.	



**Table 4-1 (con't.)  
GHG Reduction Measures and Progress Indicators**

Measure		GHG Reduction Potential (MT CO <sub>2</sub> e)	Progress Indicators	Target
Measure 4-2.C	Create a community-wide Solar Power program and remove physical and code barriers to support installation of solar panels in commercial and residential districts.	11,700	i. PV installed on 250,000 sq.ft of commercial rooftops, and 5% of total residential (new and existing) rooftops.	by 2015
			ii. PV installed on 500,000 sq.ft of commercial rooftops and 10% of total residential rooftops.	by 2020
Measure 4-3.A	Develop a Residential Energy Benchmark program to assist homeowners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.	5,730	i. 10% of existing housing units participating in the Residential Energy Benchmark program, with 5% achieving 30% increase in building energy performance.	by 2015
			ii. 20% of total housing units participating in the Residential Energy Benchmark program, with 15% achieving 30% increase in building energy performance.	by 2020
Measure 4-3.B	Develop a Commercial Energy Benchmark program to assist business owners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.	1,490	i. 10% of total commercial properties participate in the Commercial Energy Benchmark program, with 5% achieving 30% increase in building energy performance.	by 2015
			ii. 15% of total commercial properties participate in the Commercial Energy Benchmark program, with 10% achieving 30% increase in building energy performance.	by 2020
Measure 4-3.D	Develop an Energy Efficient Upgrade program for residents and business owners to promote upgrades from inefficient appliances, lighting and roofing to Energy Star certified systems.	10,080	i. 20 incandescent bulbs replaced with CFLs per housing unit. (669,500 bulbs)	by 2020
		796	ii. 5,000 residential refrigerators upgraded to Energy Star models	
		390	iii. 5,000 dishwashers upgraded to Energy Star models	
		265	iv. 5,000 clothes washers upgraded to Energy Star models	
		35	vi. 500 water coolers upgraded to Energy Star models	
		90	vii. 1,000 computers and monitors upgraded to Energy Star models	
		130	viii. 500 copy machines upgraded to Energy Star models	
		93	ix. 1,000 exit signs upgraded to LED	
		459	x. 1,500,000 square feet of roof area replaced with Energy Star cool roofs.	

**Table 4-1 (con't.)**  
**GHG Reduction Measures and Progress Indicators**

Measure		GHG Reduction Potential (MT CO <sub>2</sub> e)	Progress Indicators	Target
Measure 4-3.E	Collaborate with local utility companies and adjacent cities to accelerate smart-grid integration in the community.	3,160	i. Smart grid technology available to 30% of total households	by 2020
			ii. Smart grid technology available to 40% of total households	
Measure 4-5.A	Collaborate with SMUD to increase the use of green energy within City facilities.	10	i. Finish PV installation (32Kwh panels producing 11,680 Kwh of electricity annually) on City Hall by December 31, 2010.	by 2010
Measure 4-5.B	Reduce energy consumption in City buildings by 40% from baseline.	215	i. Install energy efficient appliances and upgrades in City Hall to reduce energy consumption by 40% from 2005.	by 2020
Measure 4-5.C	Improve lighting efficiency and decrease energy consumption in public spaces.	544	i. Replace 75% of citywide street lights to LED (3,134 lights 2007 to 2015).	by 2015
			ii. Replace 100% of citywide street lights to LED (4,179 lights 2015 to 2020).	by 2020
SUBTOTAL		43,857		
Water Efficiency and Conservation				
Measure 5-1.A	Work with the water agencies to develop plans to implement SB 7 to achieve a 20% reduction in urban water demand by 2020.	4,030	i. Achieve 10% reduction in total water consumption.	by 2015
			ii. Achieve 20% reduction in total water consumption.	by 2020
SUBTOTAL		4,030		
Waste Reduction and Diversion				
Measure 6-1.A	Establish a 2020 waste reduction target of 75% below 2005 levels and work with the County, neighboring cities and other organizations to create a low-waste plan and provide public education regarding low-waste strategies and implementation.	18,880	i. 75% reduction from 2005 per capita waste generated	by 2020
SUBTOTAL		18,880		
Green Infrastructure, Public Health and Safety				
Measure 7-1.A	Enhance the City’s urban forest and other green infrastructure to reduce building energy use, improve comfort, augment neighborhood aesthetics, improve stormwater quality, and maximize carbon capture and storage.	740	i. 1,500 new shade trees planted on private property.	by 2020
			ii. 2,500 new shade trees planted on public property and rights-of-way.	by 2020
SUBTOTAL		740		
TOTAL GHG EMISSION REDUCTION		87,267		

*Note: The progress indicators are based on the assumptions used to calculate GHG reduction potential of the primary measures. Appendix B documents the assumptions used for progress indicators and GHG reduction calculation.*

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# Appendix A: GHG Inventory

This appendix provides a description of existing and future projected greenhouse gas (GHG) emissions in Citrus Heights.

### **Citrus Heights Greenhouse Gas Emissions Inventory**

A GHG emissions inventory was conducted for each incorporated city in Sacramento County, including the City of Citrus Heights, and the unincorporated area of Sacramento County (County) for the year 2005. The inventory estimated that communitywide GHG emissions in Citrus Heights totaled approximately 578,134 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) emissions in 2005. Citrus Heights contributed approximately 4.2% of the GHG emissions generated in Sacramento County. On-road transportation emissions composed 42.8% of communitywide GHG emissions, followed by 27.7% from residential sources, and 10.8% from commercial/industrial sources (ICF Jones & Stokes 2009).

The inventory includes communitywide (i.e., those emissions attributable to all sources in Citrus Heights) and government-related operations (i.e., those emissions directly attributable to the City government operations). The GHG emissions associated with government operations are a subset of the total community-wide emissions. There is no available adopted or widely accepted methodology for evaluating GHG emissions from land use development. In the case of the City's inventory, GHG emissions associated with energy, transportation and waste (i.e., solid waste and wastewater), were modeled using the ICLEI-Local Governments for Sustainability Clean Air and Climate Protection (CACAP) software, and other calculation methodologies that involved scaling of the statewide GHG emissions inventory prepared by the California Air Resources Board (ARB).

### **Community-wide Inventory**

The purpose of the GHG emissions inventory is to assist policy makers and planners to identify the current emission sources, the relative contribution from each source, and the overall magnitude of the City's GHG emissions. This aids in development of more specific and effective policies and emissions control strategies to reduce GHG emissions consistent with State mandates (i.e., AB 32). The GHG emissions inventory is divided into the following GHG emission sectors: residential, commercial/industrial, industrial specific, on-road mobile sources, off-road mobile sources, waste, wastewater treatment, water-related, agriculture, and high GWP GHGs. All GHG emissions were presented in units of metric tons (MT) CO<sub>2</sub>e/yr, which allows emissions of other GHGs such as CH<sub>4</sub> and N<sub>2</sub>O to be normalized to a single unit of measure that accounts for GWP. Table A-1 and Figure A-1 summarize the 2005 GHG emissions inventory.

### **Government Operations Inventory**

Government operations include buildings, facilities, vehicle fleets, employee commutes, streetlights and traffic signals, and solid waste disposal that are under the jurisdiction of the City. The City's contribution to all GHG emissions sectors is captured in the community-wide inventory summarized in Table A-1. Table A-2 and Figure A-2 summarize Citrus Heights' municipal GHG emissions for 2005.

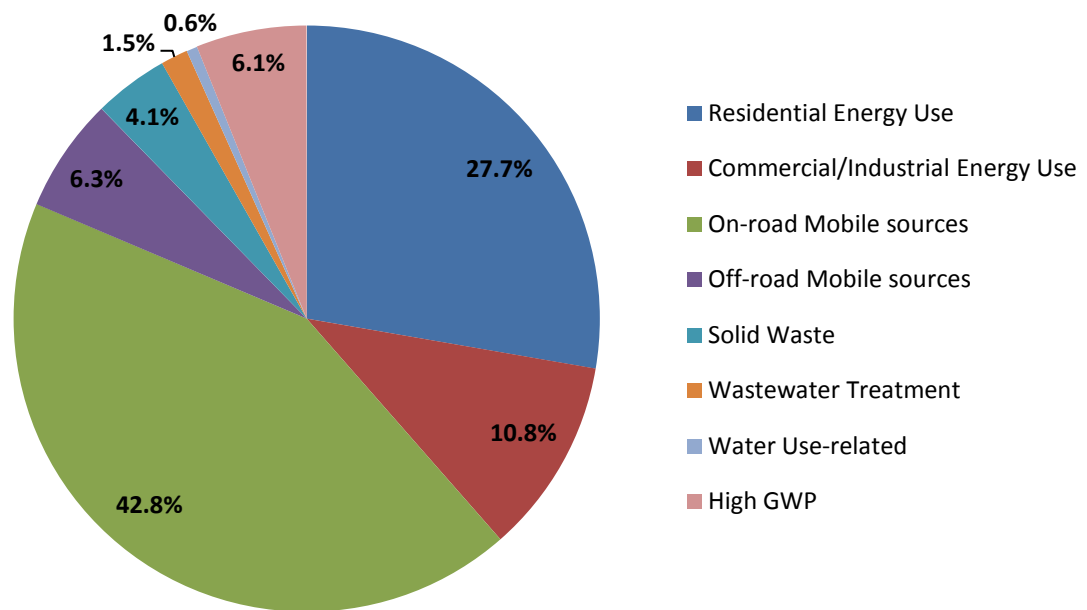
### **Greenhouse Gas Emissions Baseline**

There is currently no agency-adopted or recommended protocol to follow for preparation of community-wide GHG emissions inventories applicable to Citrus Heights. Thus, this field of practice and available tools and methods continue to evolve in the absence of standardized guidance. The City chose to refine certain aspects of the 2005 GHG emissions inventory that could potentially influence the Draft General Plan and development of the Greenhouse Gas Reduction Plan (GGRP). Thus, the GHG data presented in this section represents the emissions baseline relied upon for the GGRP. Sectors of the 2005 emissions inventory that were refined included on-road and off-road mobile-related emissions, wastewater treatment, and high GWP GHGs. Each is discussed in greater detail below and summarized in Table A-3 and Figure A-3.



Table A-1 2005 Community-wide Greenhouse Gas Emissions		
Community Sector	Inventory Emissions	
	MT CO <sub>2</sub> e	Percent
Residential Energy Use	160,429	27.7%
Commercial/Industrial Energy Use	62,553	10.8%
On-road Mobile sources	247,463	42.8%
Off-road Mobile sources	36,627	6.3%
Solid Waste	23,679	4.1%
Wastewater Treatment	8,425	1.5%
Water Use-related	3,525	0.6%
High GWP	35,433	6.1%
<b>Total</b>	<b>578,134</b>	<b>100%</b>

Source: Data compiled by AECOM 2009 from the City of Citrus Heights Greenhouse Gas Emissions Inventory.  
Notes: CO<sub>2</sub>e = carbon dioxide equivalent; DMV = Department of Motor Vehicles; GHG = Greenhouse Gas; GWP = global warming potential; MT= metric tons.



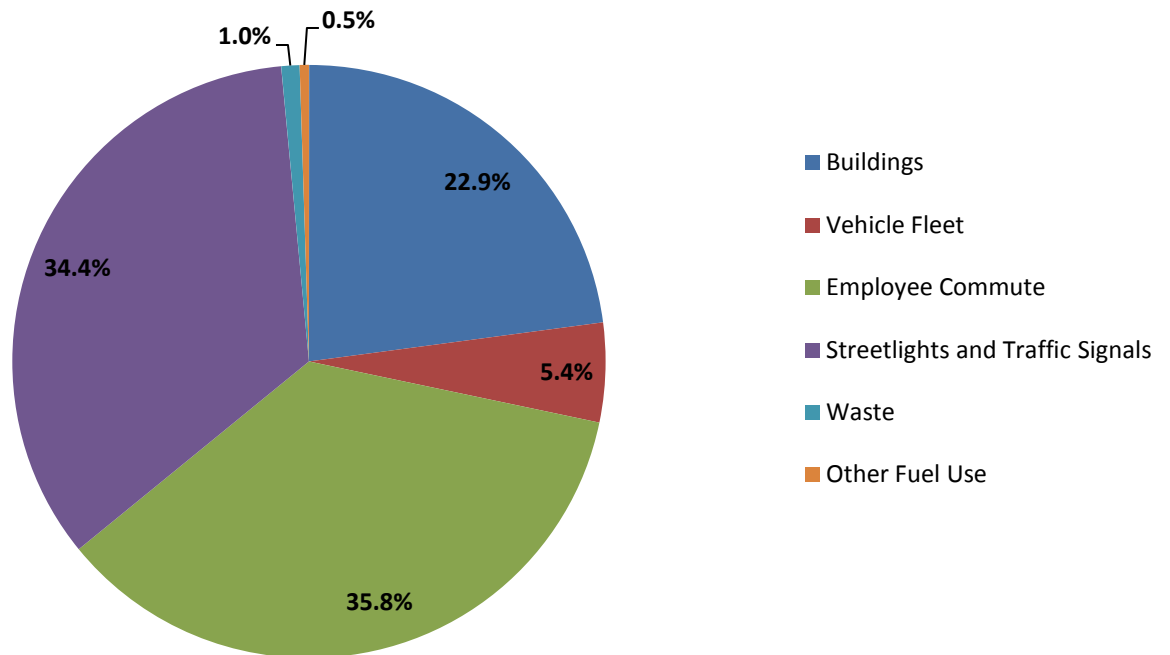
Source: ICF Jones & Stokes, 2009.

**Citrus Heights Community-wide Greenhouse Gas Emissions Inventory (2005)**

**Figure A-1**

Table A-2 2005 Government-Related Greenhouse Gas Emissions		
Government Sector	MT CO <sub>2</sub> e	Percent
Buildings	603	22.9%
Vehicle Fleet	143	5.4%
Employee Commute	945	35.8%
Streetlights and Traffic Signals	908	34.4%
Waste	25	1.0%
Other Fuel Use	14	0.5%
Total	2,638	100%

Notes: CO<sub>2</sub>e = carbon dioxide equivalent; MT= metric tons.  
Source: Data compiled by AECOM 2009 from the City of Citrus Heights' Greenhouse Gas Emissions Inventory

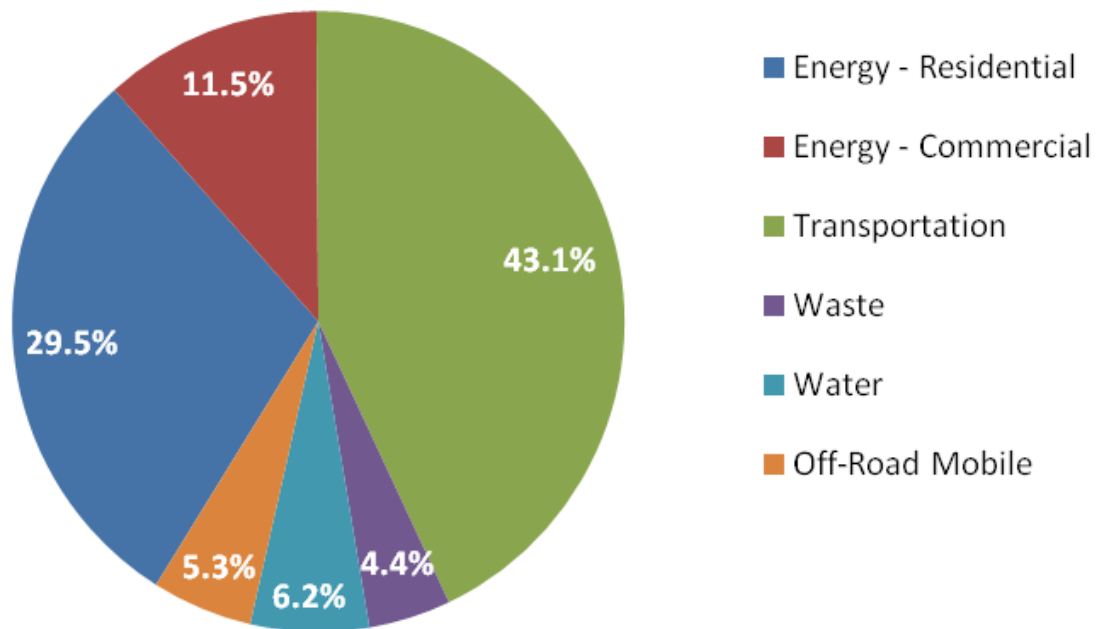


Source: ICF Jones & Stokes, 2009.

**Citrus Heights Municipal Greenhouse Gas Emissions Inventory (2005)**

**Figure A-2**

Table A-3 2005 Community-wide Greenhouse Gas Emissions Baseline		
Community Sector	Baseline Emissions	
	MT CO <sub>2</sub> e	Percent
Residential Energy Use	160,429	29.5%
Commercial/Industrial Energy Use	62,553	11.5%
On-road Mobile sources	234,231	43.1%
Off-road Mobile sources	28,877	5.3%
Solid Waste	23,679	4.4%
Wastewater Treatment	30,433	5.6%
Water Use-related	3,525	0.6%
<b>Total</b>	<b>543,727</b>	<b>100%</b>
Notes: CO <sub>2</sub> e = carbon dioxide equivalent; MT= metric tons. Source: Data compiled by AECOM 2010 from the City of Citrus Heights' Greenhouse Gas Emissions Inventory		



Source: Compiled by AECOM in 2010 from ICF Jones & Stokes, 2009

**Citrus Heights Community-wide Greenhouse Gas Emissions Baseline (2005)**

**Figure A-3**

### ***On-Road Mobile Sources***

On-road mobile-source GHG emissions were calculated using a bottom-up method based on VMT data obtained from Fehr & Peers Transportation Consultants, which used select zone assignment of SACOG's current SACMET regional travel demand forecasting (TDF) model to calculate VMT for the City of Citrus Heights under existing conditions. Vehicle trips and associated VMT were categorized according to three types of trips:

- ▶ Internal–Internal (I-I) trips, which begin and end in Citrus Heights;
- ▶ Internal–External (I-X) trips, which begin in Citrus Heights and end outside Citrus Heights; and
- ▶ External–Internal (X-I) trips, which begin outside Citrus Heights and end inside Citrus Heights.

The methodology used to calculate VMT assigns 100 percent responsibility for all I-I trips and 50 percent I-X and X-I trips to the City. This methodology is consistent with the recommendations of the Regional Targets Advisory Committee, which is the body charged with making recommendations to ARB on implementation of SB 375. On-road mobile-source GHG emissions were estimated using emission factors from the ARB's Mobile Source Emission Factor Model (EMFAC 2007) using VMT by speed bin.

The revised on-road mobile-source GHG emissions estimates account for locally (City)-generated VMT on state highways (e.g., I-80) and do not include emissions associated with trips that originate and terminate outside of Citrus Heights. The original GHG emissions inventory did not distinguish between locally-generated or pass-through VMT. In addition, the original inventory did not calculate emissions according to speed bin. Thus, this refined calculation enables the City to more accurately identify the subset of mobile-source emissions that GGRP measures and actions can influence.

### ***Off-road Mobile Sources***

Off-road mobile-source GHG emissions were calculated using a top-down method. ARB's OFFROAD emissions model contains factors for types of off-road motor vehicles such as boats, agricultural equipment, off-highway vehicles, lawn and garden equipment, and rail. The OFFROAD model aggregates off-road emissions for all of Sacramento County. Under the current inventory calculation, the total off-road GHG emissions for all of Sacramento County were apportioned using the population of each jurisdiction (incorporated cities and unincorporated areas). This approach to allocating off-road mobile-source GHG emissions is not necessarily representative of the jurisdictions in which off-road emissions sources would exist. For example, under this method, some portion of agricultural equipment-related GHG emissions would be allocated to Citrus Heights, when most of this type of equipment would be located in the unincorporated area of the County. However, this approach may be appropriate for lawn and garden equipment emissions.

The revised off-road mobile-source GHG estimates removed emissions that are not applicable to Citrus Heights (e.g., use of agricultural equipment, boats, off-highway vehicles) from the countywide OFFROAD model, but retained emissions associated with equipment that is likely used within the City (e.g., landscape and construction equipment, air compressors, generators). These emissions were then apportioned by population to Citrus Heights.

### ***Wastewater Emissions***

Domestic wastewater treatment emissions were calculated using a bottom-up calculation method for GHG emissions generated by the Sacramento Regional Wastewater Treatment Plant (WWTP). The Sacramento Regional WWTP service area includes the cities of Citrus Heights, Elk Grove, Folsom Rancho Cordova, Sacramento, West Sacramento, and a portion of unincorporated Sacramento County. Wastewater is treated at the plant using secondary treatment processes, which results in methane formation. Emission factors for methane published by the IPCC for wastewater treatment and discharge were used, along with facility-specific information on average annual flow and influent biological oxygen demand (BOD). The GHG emissions from the Sacramento Regional WWTP were distributed on a per-capita basis for the entire Sacramento Regional County Sanitation District service area, and then

allocated to Citrus Heights based on the City's population. This method more accurately estimates GHG emissions from the wastewater treatment process specific to Citrus Heights.

### **High Global Warming Potential Greenhouse Gases**

High GWP GHGs are associated with industrial processes, refrigerants, semi-conductor manufacturing, and electrical transmission. According to the City's inventory, there are no industrial-specific GHG emissions in Citrus Heights, which would indicate that there are likely few, if any, high GWP GHG emissions in the City. Thus, high GWP emissions were removed from the emissions baseline in Citrus Heights.

### **Greenhouse Gas Emissions Projections**

The baseline inventory was used to project the City's 2020 GHG emissions assuming business-as-usual consumption trends continue. The projected 2020 inventory provides an emissions profile of Citrus Heights in 2020 if it were to continue on current GHG-producing trends. Each emissions sector is projected based on appropriate indicators (e.g., population projections, historical trends). The projected 2020 GHG emissions are based on applicable indicators for each emissions sector. This section describes the methodology used to project each emissions sector. See Table A-4 for a summary of the GHG emissions projection.

<b>Table A-4 Communitywide Greenhouse Gas Emissions: 2005 and 2020</b>		
<b>Communitywide Emissions Sector</b>	<b>2005 Baseline Emissions</b>	<b>2020 BAU Projections</b>
	<b>MT CO<sub>2</sub>e</b>	<b>MT CO<sub>2</sub>e</b>
Building Energy Use (Commercial and Residential)	222,982	212,374
On-road Mobile sources (Transportation)	234,231	248,963
Off-road Mobile sources	28,877	30,693
Solid Waste	23,679	25,168
Wastewater and Water Use	33,958	39,198
<b>Total</b>	<b>543,727</b>	<b>556,396</b>
<b>% Change from 2005</b>		<b>+2.3%</b>
Notes: BAU = "business as usual"; CO <sub>2</sub> e = carbon dioxide equivalent; MT= metric tons. Totals may not appear to add due to rounding.		
<sup>1</sup> Off-road mobile-source emissions are related to emissions from off-road motor vehicles such as boats, agricultural equipment, off-highway vehicles, lawn and garden equipment, and rail.		
Source: Data compiled by AECOM from the City of Citrus Heights Greenhouse Gas Emissions Inventory 2009 and modeled by AECOM 2010		

### **Energy Consumption**

In order to estimate GHG emissions associated with Citrus Heights' energy consumption in 2020, an annual average growth rate was applied to the 2005 baseline electricity and natural gas consumption data. The U.S. Department of Energy (DOE) Energy Information Administration (EIA) publishes an annual Energy Outlook Report that forecasts electricity and natural gas consumption by land use type (i.e., residential, commercial, and industrial) for regions throughout the U.S. For Citrus Heights' 2020 energy projections, the Pacific region forecasts from the 2010 Annual Energy Outlook were used to calculate the annual average growth rate in electricity and natural gas consumption for residential, commercial, and



industrial land uses (EIA 2010<sup>1</sup>). SMUD-specific emission factors were used to calculate 2020 energy-related GHG emissions.

### ***Transportation***

Citrus Heights' 2020 local roadway VMT was projected using anticipated general plan population growth between 2005 and 2020 of 6.3%. Transportation-related CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions were calculated using similar methods as those described above for the baseline inventory. However, year 2020 parameters from EMFAC2007 were used to generate emission factors.

### ***Solid Waste***

Citrus Heights' 2020 solid waste GHG emissions were projected using anticipated general plan population growth between 2005 and 2020 of 6.3%.

### ***Water Consumption***

Citrus Heights' projected 2020 water consumption emissions were projected using anticipated general plan population growth between 2005 and 2020 of 6.3%.

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<sup>1</sup> Energy Information Administration. 2010. Annual Energy Outlook 2010: Supplemental Tables: Consumption & Prices by Sector & Census Division. Available at < <http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html>>. Accessed February 20, 2010.

# **Appendix B: Greenhouse Gas Reductions**

This appendix summarizes the assumptions and parameters used to calculate GHG emission reduction performance of Greenhouse Gas Reduction Plan (GGRP) measures. The table below summarizes the GHG reductions generated by measures in the GGRP.

Summary Table of Greenhouse Gas Reduction Measure Performance		
Measure Number and Title	GHG Emission Reductions (MT CO <sub>2</sub> e)	
Community Engagement and Leadership	Without Statewide Reductions	With Statewide Reductions
1-1.D: Community workshops and education programs	49,504 <i>*Reduction not counted separately</i>	
Transportation and Connectivity		
3-2.A: Develop Ride Share Infrastructure	1,230	930
3-4.A: Low-Carbon and Alternative Fuel Vehicles		
Purchase hybrid and electric vehicles	11,085	11,085
Installation of electric charging stations	1,125	1,125
3-5.A: Increase Bicycle and Pedestrian Mode Share	3,730	2,830
3-6.A: Increase Public Transit Mode Share	2,490	1,890
3-7.A: Increase Fuel Efficiency of City Fleet	40	40
3-7.B: Alternative Transportation Incentives for City Employees	60	60
Energy Efficiency and Conservation		
4-2.B: Upgrade to Solar Water Heaters		
Residential solar hot water systems	7,480	7,480
Commercial solar hot water systems	1,190	1,190
4-2.C: Solar Power Program		
Residential solar rooftop systems	9,300	9,300
Commercial solar rooftop systems	2,400	2,400
4-3.A: Residential Benchmark Program	5,730	5,730
4-3.B: Commercial Benchmark Program	1,490	1,490
4-3.D: Energy Efficiency Upgrade	12,338	12,338
4-3.E: Smart Grid Integration		
Existing residential smart grid appliances	1,510	1,510
Existing commercial smart grid appliances	1,050	1,050
New construction smart grid appliances	600	600
4-5.A: Increase Green energy Purchase in City Facilities	10	10
4-5.B: Reduce City Facilities' Energy Consumption	215	215
4-5.C: Improve Street Light Efficiency	544	544
Water Efficiency and Conservation		
5-1.A: Water Demand Reduction	4,030	4,030
5-4.A: Municipal Irrigation Water Demand Reduction	<1	<1
Waste Reduction		
6-1.A: Increase Recycling, Composting, and Waste Diversion Programs	18,880	18,880
Green Infrastructure, Public Health and Safety		
7-1.A: Increase Urban Forest	740	740
Statewide Legislation		
AB 1493: Vehicle Emission Standards	-	39,240
Low Carbon Fuel Standard (LCFS)	-	20,970
<b>Total Reductions</b>	<b>87,267</b>	<b>145,677</b>
<b>Notes:</b> 1. Totals may not appear to add up as emission reductions within each sector have been rounded to the nearest whole number. 2. The GGRP measures provided in Chapter 3 report GHG emissions without assuming Statewide reductions. 3. The GHG reductions with Statewide implementation of AB 1493 and LCFS mainly affect transportation measures. The combined effects of statewide reductions along with the GGRP measures will increase the efficiency of the plan. 4. Does not include supporting measures		

## GHG Reduction Analysis for GGRP Measures

### Community Leadership and Engagement

1-1.D: Conduct regular community workshops and education programs to increase community participation and understanding of various transit, energy, water, waste and green infrastructure efficiency strategies and technologies.

GHG Reduction Calculation Supported by Public Outreach				
Measure	Participation Rate	Reduction MT CO <sub>2</sub> e	Public Outreach Assumption	Portion of Reductions Due to Public Outreach
Residential Retrofit	15%	5,730	5%	1,910
Commercial Retrofit	10%	1,490	5%	745
Smart Grid Residential - Retrofit	30%	1,510	30%	1,510
Smart Grid Commercial - Retrofit	40%	1,050	40%	1,050
Photovoltaic - Residential	10%	9,300	5%	4,650
Photovoltaic - Commercial		2,400	25%	600
Solar Hot Water - Residential	30%	7,480	5%	1,247
Solar Hot Water - Commercial	20%	1,190	5%	298
Appliance Efficiency				
Refrigerator Upgrade - Res		796	100%	796
Dishwasher Upgrade - Res		390	100%	390
Clothes Washer Upgrade - Res		265	100%	265
Exit Signs Upgrade - Com		93	100%	93
Copy Machine Upgrade - Com		130	100%	130
Water Cooler Upgrade - Com		35	100%	35
Monitor & Computer Upgrade - Com		90	100%	90
Light Bulb Replacement - Res		10,080	100%	10,080
Cool Roofs		461	100%	461
Bike and Ped		3,730	10%	373
Public Transit		2,490	10%	249
Rideshare		1,230	25%	308
Electric charging stations		1,121	5%	56
Hybrid and Electric Vehicles - Community		11,085	100%	11,085
Waste		18,880	50%	9,440
Water		4,030	80%	3,224
Shade Trees - Building Energy		105	100%	105
Street Trees - Carbon Sequestration and Urban heat island		631	50%	316
<b>Sum</b>		<b>85,792</b>		<b>49,504</b>

## Transportation and Connectivity

### 3-2.A: Rideshare

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>3-2.A:</b> Develop rideshare infrastructure to facilitate participation by those travelling from Citrus Heights to major employment centers such as Downtown Sacramento or Roseville.	This measure requires the City to implement a series of prescribed actions that will facilitate and encourage the use of carpooling for City residents to commute to major employment centers. These actions include working with nearby cities and major companies to develop car-share and local car rental opportunities, requiring ride-share parking spaces at employment and commercial centers, and requiring ride-share parking spaces near bus stops, employment centers and commercial areas (e.g., Sunrise MarketPlace, Auburn Boulevard).			
	This measure estimates the reduction in transportation-related emissions resulting from a 1.5% mode-shift from single-occupancy vehicles to rideshare alternatives. According to the 2000 US Census, about 13% of Citrus Heights residents carpoolled to get to work. Literature indicates that ridesharing programs typically attract 5–15% of commute trips if they offer only information and encouragement, and 10–30% if they also offer financial incentives such as parking cash out or vanpool subsidies (York and Fabricatore, 2001). The measure assumes that enhanced ride matching and rideshare infrastructure will increase the mode share from 10% to 12%. The percent of total trips that are assumed to be commute trips was obtained from URBEMIS2007 Version 9.2.4.			
	Transportation sector emissions (without statewide reductions): 248,963 MT CO <sub>2</sub> e/yr	Percent commute trips of total trips: 33%	Without statewide reductions: 1,230 MT CO <sub>2</sub> e/yr	<i>U.S Census 2000, Citrus Heights, Commute to work.</i>  <i>Mixed-use neighborhood center VMT reduction performance</i>
	Transportation sector emissions (with statewide reductions): 188,753 MT CO <sub>2</sub> e/yr	Percent of mode shift: 1.5%	With statewide reductions: 930 MT CO <sub>2</sub> e/yr	<i>Dagang, Deborah. 1995. Transportation impact factors: Quantifiable relationships. Victoria Transport Policy Institute. Victoria BC.</i>
<b>Supporting Measure</b>	3-2.B: Work with employers to offer incentives and services that increase use of alternatives to single-occupant autos.			

### 3-4.A: Alternative Fuel

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>3-4.A:</b> Create infrastructure to promote use of low-carbon and alternative fuel vehicles.	This measure requires the City to implement a series of infrastructure improvements, incentives, and educational programs to promote the use of alternative fueled vehicles. Infrastructure improvements include priority parking and charging stations for neighborhood electric vehicles and installation of secured charging stations at new residential, commercial, and office buildings. Incentive programs include financial incentives for purchasing lower-carbon vehicles such as hybrids and electric automobiles.			
	The emission reductions achieved through implementation of this measure were estimated using the ICLEI Climate and Air Pollution Planning Assistant Version 1.0 calculator for alternative fueled vehicles (ICLEI 2010). Implementation of Measure 3-4.A assumes that over the next 10 years, Citrus Heights residents will add 1,500 hybrid vehicles and 1,500 electric vehicles that will replace old vehicles in the community. The emission reductions also assume that 700 electric vehicle charging stations will be installed in the community as support infrastructure to promote electric vehicles.			
	See CAPPA tables below	Hybrid vehicles: 1,500  Electric vehicles: 1,500  Electric charging stations: 700	Hybrid and electric vehicles: 11,085 MT CO <sub>2</sub> e/yr  Electric charging stations: 1,125 MT CO <sub>2</sub> e/yr  Total: 12,210 MT CO <sub>2</sub> e/yr	<i>Climate and Air Pollution Planning Assistant (CAPPA).</i> <i>Available: <a href="http://www.icleiusa.org/action-center/tools/cappa-decision-support-tool">http://www.icleiusa.org/action-center/tools/cappa-decision-support-tool</a></i>
<b>Supporting Measure</b>	3-4.B: Promote communitywide use of alternative fuels by providing public outreach and education regarding the benefits of low-carbon and alternative fuels.			



## ICLEI CAPPA V 1.0 - Hybrid Vehicle Calculations:

### Degree of Implementation

The default values below are based on a typical degree of implementation of this strategy, as well as your previous responses to user input questions. However, your local scenario may vary significantly. CAPPA will assume that if you choose to include this strategy in your local climate action plan, this degree of implementation will apply. Adjust as appropriate to your local circumstance by editing the cell in blue below. **Changes to the Degree of Implementation must be saved using the Save Changes button before navigating away from this sheet.**

#### Community

1,500	Number of Hybrids Used
-------	------------------------

Save Changes

### Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPPA will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below. **Changes made to blue cells here need to be saved using the Save function from the Excel File Menu.**

#### Community

\$2.64	Price of Gasoline (\$ per gallon)
46	Hybrid Miles per Gallon
19.7	Miles per Gallon of Vehicle Replaced
12,042	Average Annual Miles per Vehicle
\$2,530	Incremental Cost of Hybrid
524,230	Annual Gasoline Savings (gallons)
\$1,383,966	Annual Cost Savings
2.7	Simple Payback (years)

Restore Defaults

### Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

#### Government Operations

CO <sub>2</sub> e (metric tons)	NO <sub>x</sub> (lbs)	SO <sub>x</sub> (lbs)	CO (lbs)	VOCs (lbs)	PM <sub>10</sub> (lbs)
49	16	1	3,544	372	8

View Complete  
Emission  
Coefficients Set

#### Community

CO <sub>2</sub> e (metric tons)	NO <sub>x</sub> (lbs)	SO <sub>x</sub> (lbs)	CO (lbs)	VOCs (lbs)	PM <sub>10</sub> (lbs)
4,934	1,566	102	354,391	37,166	762

#### Per Unit Reductions

CO <sub>2</sub> e (metric tons) per vehicle	NO <sub>x</sub> (lbs) per vehicle	SO <sub>x</sub> (lbs) per vehicle	CO (lbs) per vehicle	VOCs (lbs) per vehicle	PM <sub>10</sub> (lbs) per vehicle
3.29	1.04	0.07	236.26	24.78	0.51

## ICLEI CAPPA V 1.0 - Electric Vehicle Calculations:

### Degree of Implementation

The default values below are based on a typical degree of implementation of this strategy, as well as your previous responses to user input questions. However, your local scenario may vary significantly. CAPP will assume that if you choose to include this strategy in your local climate action plan, this degree of implementation will apply. Adjust as appropriate to your local circumstance by editing the cell in blue below. **Changes to the Degree of Implementation must be saved using the Save Changes button before navigating away from this sheet.**

#### Community

1,500	Number of Electric Vehicles
-------	-----------------------------

Save Changes

### Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPP will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below. **Changes made to blue cells here need to be saved using the Save function from the Excel File Menu.**

#### Community

\$3.00	Price of Gasoline (\$ per gallon)
\$ 0.1094	Price of Electricity (\$ per kWh)
19.7	Miles per Gallon of Vehicle Replaced
12,042	Average Annual Miles per Vehicle
\$10,000	Incremental Cost of Electric Vehicle
916,904	Annual Gasoline Savings (gallons)
7,232,432	Annual Electricity Use (kWh)
\$1,959,483	Annual Cost Savings
7.7	Simple Payback (years)

Restore Defaults

### Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select utility  
region

WECC California (CAMX)

#### Community

CO2e (metric tons)	NOx (lbs)	SOx (lbs)	CO (lbs)	VOCs (lbs)	PM10 (lbs)
6,152	-1,728	-3,662	615,753	64,542	-2,283

View Complete  
Emission  
Coefficients Set

#### Per Unit Reductions

CO2e (metric tons) per vehicle	NOx (lbs) per vehicle	SOx (lbs) per vehicle	CO (lbs) per vehicle	VOCs (lbs) per vehicle	PM10 (lbs) per vehicle
4.10	-1.15	-2.44	410.50	43.03	-1.52

## ICLEI CAPPA V 1.0 – Electric Vehicle Charging Station Calculations:

### Degree of Implementation

The default values below are based on a typical degree of implementation of this strategy, as well as your previous responses to user input questions. However, your local scenario may vary significantly. CAPPA will assume that if you choose to include this strategy in your local climate action plan, this degree of implementation will apply. Adjust as appropriate to your local circumstance by editing the cell in blue below. **Changes to the Degree of Implementation must be saved using the Save Changes button before navigating away from this sheet.**

#### Community

700	Number of Charging Spaces
-----	---------------------------

Save Changes

### Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPPA will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below. **Changes made to blue cells here need to be saved using the Save function from the Excel File Menu.**

#### Community

\$2.64	Price of Gasoline (\$ per gallon)
\$ 0.0988	Price of Electricity (\$ per kWh)
19.7	Miles per Gallon of Vehicle Replaced
4,704	Average Annual Vehicle Miles per Charging Space
167,147	Annual Gasoline Savings (gallons)
1,318,438	Annual Electricity Use (kWh)
\$311,007	Annual Cost Savings

Restore Defaults

### Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select utility  
region

WECC California (CAMX)



Community

### 3-5.A: Bikes and Pedestrians

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
3-5.A: Maximize pedestrian and bicycle use through high-quality design, enhanced infrastructure, and enforcing bike and pedestrian travel rights.	Quantification of this measure assumes that implementation would result in a 1.5% mode shift from total single-occupancy vehicles to bicycle travel and walking. The anticipated mode shift assumption is based on the past trend shown for walking and biking options to commute to work per the Census data (2000). According to the 2000 US Census, less than 2% of Citrus Heights residents biked or used another means to get to work. However the final emission reduction calculation is based on mode shift in all types of trips.			
	Transportation sector emissions (without statewide reductions): 248,963 MT CO <sub>2</sub> e/yr	Percent of mode shift: 1.5%	Without statewide reductions: 3,730 MT CO <sub>2</sub> e/yr	U.S Census 2000, Citrus Heights, Commute to work.
	Transportation sector emissions (with statewide reductions): 188,753 MT CO <sub>2</sub> e/yr		With statewide reductions: 2,830 MT CO <sub>2</sub> e/yr	
Supporting Measure	3-5.B: Increase bicycle infrastructure by requiring bicycle parking in new development, retrofitting parking lots in underserved civic and commercial areas to include bike racks and bike parking facilities, and participating in a regional bikesharing program.			

### 3-6.A: Public Transit

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>3-6.A:</b> Conduct a public transit gap study analyzing strategies to increase transit use and funding sources for transit improvements. Work with regional transit agencies to provide bus route coverage to underserved areas.	Quantification of this measure assumes that implementation would result in a 1% mode shift from total single-occupancy vehicles to public transit. The anticipated mode shift assumption is based on the trend in transit ridership from Census data (2000 and 2008) and based on City's plans for operation and expansion of service. However, the transportation emission calculates mode shift to transit for all types of trips.			
	Transportation sector emissions (without statewide reductions): 248,963 MT CO <sub>2</sub> e/yr	Percent of mode shift: 1.0%	Without statewide reductions: 2,490 MT CO <sub>2</sub> e/yr	York and Fabricatore (2001), Puget Sound Vanpool Market Assessment, Office of Urban Mobility, WSDOT  Rimpo and Associates Inc.. 2008. URBEMIS2007 for Windows Version 9.2.4. Available: <a href="http://www.urbemis.com/">http://www.urbemis.com/</a> .
	Transportation sector emissions (with statewide reductions): 188,753 MT CO <sub>2</sub> e/yr		With statewide reductions: 1,890 MT CO <sub>2</sub> e/yr	
<b>Supporting Measure</b>	3-6.B: Work with Regional Transit, E-Tran, Roseville Transit, Amtrak and other transit agencies to develop a regional pass system.			

### 3-7: Municipal Transportation Policies

<b>3-7.A:</b> Improve fuel-efficiency of the City fleet by purchasing low or zero-emission vehicles when vehicles are retired from service. (Public safety vehicles are exempted from this requirement.)	This measure assumes that the City will replace 10 vehicles from the municipal fleet with electric vehicles. The emission reductions achieved through implementation of this measure were estimated using the ICLEI Climate and Air Pollution Planning Assistant Version 1.0 calculator for alternative fueled vehicles (ICLEI 2010).			
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ICLEI CAPPA V 1.0 - Electric Vehicle Calculations:



### Degree of Implementation

The default values below are based on a typical degree of implementation of this strategy, as well as your previous responses to user input questions. However, your local scenario may vary significantly. CAPP will assume that if you choose to include this strategy in your local climate action plan, this degree of implementation will apply. Adjust as appropriate to your local circumstance by editing the cell in blue below. **Changes to the Degree of Implementation must be saved using the Save Changes button before navigating away from this sheet.**

#### Government Operations

10	Number of Electric Vehicles
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### Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPP will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below.

**Changes made to blue cells here need to be saved using the Save function from the Excel File Menu.**

#### Government Operations

\$2.64	Price of Gasoline (\$ per gallon)
\$ 0.0988	Price of Electricity (\$ per kWh)
19.7	Miles per Gallon of Vehicle Replaced
12,042	Average Annual Miles per Vehicle
\$10,000	Incremental Cost of Electric Vehicle
6,113	Annual Gasoline Savings (gallons)
48,216	Annual Electricity Use (kWh)
\$11,374	Annual Cost Savings
8.8	Simple Payback (years)

### Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select utility region

#### Government Operations

CO <sub>2</sub> e (metric tons)	NO <sub>x</sub> (lbs)	SO <sub>x</sub> (lbs)	CO (lbs)	VOCs (lbs)	PM <sub>10</sub> (lbs)
41	-12	-24	4,105	430	-15

## 3-7: Municipal Transportation Policies

### 3-7.B:

**Provide financial incentives to encourage ridesharing and/or public transit use among City employees.**

This measure assumes that the 8.5% of City employees use flexible work schedules in any given day. This helps to reduce peak hour traffic congestion and increase flexibility to work from home, thereby reducing GHG emissions associated with driving. The City would also provide financial incentives to its employees to promote alternative transportation modes such as public transit, and rideshare. The emission reductions achieved through implementation of this measure were estimated using the ICLEI Climate and Air Pollution Planning Assistant Version 1.0 calculator for alternative fueled vehicles (ICLEI 2010).



## Energy Efficiency and Conservation

### 4-2: Solar Hot Water Systems

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-2.B:</b> Collaborate with utility companies to provide financial incentives/rebates for residential and commercial buildings to upgrade from inefficient water heaters to solar water heaters.	For solar hot water systems, a bottom-up calculation was performed assuming that solar hot water heaters will supply approximately 70% of the energy required for water heating. The emission reductions were calculated by multiplying participation rates of residential and commercial buildings by the percent reduction in natural gas consumption for water heating.			
	Residential: 60% Reduction in Natural Gas Reduction in Energy Consumption	30% of total residential	Residential: 7,480 MT CO <sub>2</sub> e/yr	Energy Star. 2009. Solar Water Heater. <a href="http://www.energystar.gov/ia/new_homes/features/WaterHtrs_062906.pdf">www.energystar.gov/ia/new_homes/features/WaterHtrs_062906.pdf</a>
	Commercial: 40% Reduction in Natural Gas Reduction in Energy Consumption	20% of total commercial	Commercial: 1,190 MT CO <sub>2</sub> e/yr	Department of Energy. California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings  CEC source: CEC 2005. Electricity usage during Peak Periods. Available: <a href="http://www.energy.ca.gov/electricity/peak_loads.html">www.energy.ca.gov/electricity/peak_loads.html</a>

### 4-2: Community-wide Solar Power Program

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-2.C:</b> Create a community-wide Solar Power program and remove physical and code barriers to support installation of solar panels in commercial and residential districts.	This measure assumes that at least 10% of total residential roof tops and 500,000 square feet of commercial roof tops will be identified by the City for photovoltaic panel installation. The carbon offset capacity of a solar panel is calculated by multiplying solar irradiance with system efficiency. The measure assumes that for six hours of daily solar generation, the system offsets 0.00479107 MT/ sq.ft/year (when solar irradiance =5.43KWh/sq.m/ day and system efficiency is 21.6KWh/sq.ft/ year).			
	Carbon offset 0.00479107 MT/sq.ft/year	10% of total residential roof tops  500,000 sq.ft of total commercial roof tops	Residential: 9,300 MT CO <sub>2</sub> e/yr  Commercial: 2,400 MT CO <sub>2</sub> e/yr	SMUD Electricity Emissions Factor = 489 lbs/Mwh  <a href="http://www.findsolar.com/index.php?page=rightforme">http://www.findsolar.com/index.php?page=rightforme</a>

#### 4-3: Residential Energy Efficiency Retrofits

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-3.A:</b> Develop a Residential Energy Benchmark program to assist homeowners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.	The energy efficiency retrofit program is designed to encourage homeowners to implement energy conservation measures. The GHG emission reductions were calculated based on the estimated participation rate of 15% of existing residential homes. The assumption is that since most homes in Citrus Heights were constructed prior to Title 24 implementation, the community can reduce GHG emissions by retrofitting older homes to comply with Title 24 standards. Title 24 energy efficiency standards for new construction have also improved over the years so that buildings constructed in the last 15 years, in particular, perform much better than buildings constructed 15 to 30 years ago. Therefore, the GHG reduction is calculated on the assumption that by creating a Citrus Heights-specific Residential Energy Benchmark program that enlists a number of ways to reduce energy consumption the City can reduce almost 30% of energy use for baseline year.			
	30% reduction in energy consumption from baseline	15% of Existing Residential Buildings by 2020	5,730 MT CO <sub>2</sub> e/yr	<i>Sacramento County. 2009. Greenhouse Gas Emissions Inventory for Sacramento County.</i>

#### 4-3: Commercial Energy Efficiency Retrofits

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-3.B:</b> Develop a Commercial Energy Benchmark program to assist business owners to identify voluntary retrofit opportunities and funding options to increase building energy performance by 30% from baseline.	The energy efficiency retrofit program is designed to encourage commercial building owners to implement energy conservation measures. The GHG emission reductions were calculated based on the estimated participation rate of 10% of existing commercial buildings. Most commercial buildings were built prior to Title 24 energy efficiency standards. The community can reduce GHG emissions by retrofitting older commercial and office buildings to comply with Title 24 standards. By developing an Energy Benchmark program, the City will encourage higher levels of voluntary participation and acceptance of the program. Measures will include sealing building envelopes through insulation and weatherization, replacing old windows with modern energy efficient windows, and converting older boilers with new Energy Star models.			
	30% reduction in energy consumption from baseline	10% of Existing Commercial Buildings by 2020	1,490 MT CO <sub>2</sub> e/yr	<i>Sacramento County. 2009. Greenhouse Gas Emissions Inventory for Sacramento County.</i>

### 4-3: Household Appliances

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
	Energy efficient appliances and building materials generate GHG emissions reductions through decreasing the electricity demand of a given building. The appliances, along with reflective envelope treatments (cool roof) listed below all have an average energy savings compared to the typical conventional systems. This energy savings was assumed and applied to the participating home and building owners to arrive at a total annual energy savings (kWh/yr). The participation rates for these various appliance upgrades are based on the average appliance life of 25 years, which results in 4% of all appliances being replaced each year. The final calculation was based on the ICLEI model.			
<b>4-3.D:</b> Develop an Energy Efficient Upgrade program for residents and business owners to promote upgrades from inefficient appliances, lighting and roofing to Energy Star certified systems.	<u>Energy Savings</u> Refrigerator: 464 kWh/year Dishwasher: 137kWh/year Clothes Washer: 144 kWh/year Light bulbs: 44 kWh year Copy machines: 12 – 1,702 kWh/year Exit Signs: 272 kWh/year Water Coolers: 408 kWh/year Monitors: 61 kWh/year Computers: 201 kWh/year Cool roofs: 0.84kWh/sq.ft/year	Refrigerator: 5,000 households Dishwasher: 5,000 households Clothes Washer: 5,000 households Light bulbs (assumes 20 replacements per building): 669,000 bulbs Copy machines: 500 Exit Signs: 1,000 Water Coolers: 500 Monitors: 1,000 Computers: 1,000 Cool Roofs: 1,500,000 sq.ft	Refrigerators: 796 MT CO <sub>2</sub> e/yr Dishwashers: 390 MT CO <sub>2</sub> e/yr Clothes Washers: 265 MT CO <sub>2</sub> e/yr Light Bulbs: 10,080 MT CO <sub>2</sub> e/yr Copy machines: 130 MT CO <sub>2</sub> e/yr Exit signs: 91 MT CO <sub>2</sub> e/yr Water Coolers: 35 MT CO <sub>2</sub> e/yr Monitors: 20 MT CO <sub>2</sub> e/yr Computers: 70 MT CO <sub>2</sub> e/yr Cool roofs: 461 MT CO <sub>2</sub> e/yr  <b>Total: 12,338 MT CO<sub>2</sub>e/yr</b>	<i>Climate and Air Pollution Planning Assistant (CAPPA). Available: <a href="http://www.icleiusa.org/action-center/tools/cappa-decision-support-tool">http://www.icleiusa.org/action-center/tools/cappa-decision-support-tool</a></i>
<b>Supporting Measure</b>	4-3.C: Develop a Multi-family Energy Efficiency program to provide comprehensive, performance-based energy testing and installation of energy saving improvements for qualified multi-family residents.			

### 4-3: Smart Grid

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
	This measure would catalyze the City's integration into the "Smart Grid" system. This system would help the community manage and serve its electricity needs more efficiently in every demand scenario (e.g., peak and off-peak). The City's integration into the "Smart Grid" system is anticipated to reduce total electricity consumption from the existing residential and commercial buildings by 6% and 8%, respectively.			
<b>4-3.E:</b> Collaborate with local utility companies and adjacent cities to accelerate smart-grid integration in the community.	Existing Residential Buildings: 6% reduction in fossil fuel generated electricity Existing Commercial Buildings: 8% reduction in fossil fuel generated electricity New Construction: 8% reduction in fossil fuel generated electricity	Existing residential buildings with smart-meters: 30% Existing commercial buildings with smart-meters: 40% New construction with smart-meters: 60%	Existing Residential Buildings: 1,510 MT CO <sub>2</sub> e/yr Existing Commercial Buildings: 1,050 MT CO <sub>2</sub> e/yr New Construction: 600 MT CO <sub>2</sub> e/yr	<i>SMART 2020: Enabling the low carbon economy in the information age, The Climate Group on behalf of the Globale Sustainability Initiative (GeSI)</i>  <i>Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004 Prepared for the Pacific Northwest National Laboratory (p. 25)</i>

#### 4-5: Municipal

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-5.A:</b> Collaborate with SMUD to increase the use of green energy within City facilities.	This measure credits the City for installing solar panels on public buildings, such as on the roofs of the Community Center (65 kilowatt-hour [Kwh] panels producing 23,922 Kwh/yr) and City Hall (32 Kwh panels producing 11,680 Kwh of electricity annually).			
	Carbon offset = production * SMUD emissions factor	65 Kwh panel on Community Center and 32 Kwh panel on City Hall	10 MT CO <sub>2</sub> e/yr	SMUD Electricity Emissions Factor = 489 lbs/Mwh <a href="http://www.findsolar.com/index.php?page=rightforme">http://www.findsolar.com/index.php?page=rightforme</a>

#### 4-5: Municipal

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-5.B:</b> Reduce energy consumption in City buildings by 40% from baseline.	The quantification for this measure assumes that first the City will partner with SMUD to determine baseline electricity use, and then create a plan to reduce electricity consumption by 40% from baseline by 2020. Based on a 2005 analysis, the City Hall used 4,364,487 Kwh/year of electricity and 17,583 therms of natural gas (total energy consumption produces 1,061.6 CO <sub>2</sub> e/year). By implementing a plan that reduces energy use by 40%, the City will produce less GHG emissions associated to energy usage (total of 849.3 CO <sub>2</sub> e/year)			
	Carbon offset = production X Emfac	40% reduction in energy use	212 MT CO <sub>2</sub> e/yr	SMUD Electricity Emissions Factor = 489 lbs/Mwh; Natural gas Emissions Factor = 53.06 lbs/Kwh

#### 4-5: Municipal

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>4-5.C:</b> Improve lighting efficiency and decrease energy consumption in public spaces.	Citrus Heights maintains 4,179 streetlights and 64 traffic lights. This measure credits the City for replacing all incandescent street light to LED lights. The emission reductions achieved through implementation of this measure were estimated using the ICLEI Climate and Air Pollution Planning Assistant Version 1.0 calculator (ICLEI 2010).			

## ICLEI CAPPA V 1.0–LED Streetlights Calculation:

### Degree of Implementation

The default values below are based on a typical degree of implementation of this strategy, as well as your previous responses to user input questions. However, your local scenario may vary significantly. CAPPA will assume that if you choose to include this strategy in your local climate action plan, this degree of implementation will apply. Adjust as appropriate to your local circumstance by editing the cell in blue below. **Changes to the Degree of Implementation must be saved using the Save Changes button before navigating away from this sheet.**

#### Government Operations

4,179	Street Lights Replaced with LED Street Lights	Save Changes
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### Cost Impacts

The default values below are based on the reported collective experience of US local governments throughout the ICLEI network. CAPPA will assist you in estimating emissions and cost impacts and developing a local climate action plan based on these values. Adjust as appropriate to your local circumstance by editing the blue cells below. **Changes made to blue cells here need to be saved using the Save function from the Excel File Menu.**

#### Government Operations

11	Hours of Streetlight Operation	
\$ 0.0988	Price of Electricity (\$ per kWh)	
20	Percent Mercury Vapor Lamps	
6	Percent Metal Halide Lamps	
64	Percent High Pressure Sodium Lamps	
10	Percent Low Pressure Sodium Lamps	
182	Wattage of Mercury Vapor Lamps	
200	Wattage of Metal Halide Lamps	
192	Wattage of High Pressure Sodium Lamps	
180	Wattage of Low Pressure Sodium Lamps	
1,587,935	Total Annual Energy Savings (kWh)	
\$156,888	Annual Cost Savings	
0.2	Simple Payback (years)	

Restore Defaults

### Associated Annual Greenhouse Gas and Criteria Air Pollutant Emissions Reductions

The values below are calculated using default emissions factors consistent with those contained in the Clean Air and Climate Protection software.

Select Utility Region	WECC California (CAMX)	▼
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#### Government Operations

CO2e (metric tons)	NOx (lbs)	SOx (lbs)	CO (lbs)	VOCs (lbs)	PM10 (lbs)
544	981	843	899	102	794



## Water Efficiency and Conservation

### 5-1: Source Reduction

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>5-1.A:</b> Work with the water agencies to develop plans to implement SB 7 to achieve a 20% reduction in urban water demand by 2020.	In order to estimate the GHG reductions associated with implementation of these water conservation measures, 2005 urban water consumption and population values were used to estimate baseline per capita water consumption. Water consumption in 2020, under a business-as-usual scenario, was estimated using 2020 population growth estimates consistent with the General Plan. Assuming achievement of the water conservation target, a 20% reduction (from the 2005 baseline) in the per capita water consumption rate and the projected 2020 population were used to estimate 2020 water consumption levels with conservation, which were subtracted from the projected 2020 water consumption levels without conservation to calculate the annual water savings achieved in year 2020. Similar to the methods used to calculate water-related GHG emissions for the inventory, these annual water savings were used to calculate the amount of electricity consumption and GHG emissions (associated with conveyance, distribution, and treatment of the water) that would be avoided as a result of achieving the 20% target. Thus, this measure would result in a GHG emissions reduction of approximately 4,030 MT CO <sub>2</sub> e/yr.			
	20% reduction in water use for indoor applications	235 gallons per capita/ day	4,030MT CO <sub>2</sub> e/yr	CCAR General Reporting Protocol Version 3.1 (Table C.2)
<b>Supporting Measures</b>	5-1.B: Continue to provide a free irrigation review program for residential and commercial buildings and implement a monitoring plan to evaluate if program users are effectively using the irrigation review report to reduce water demand by 20%.			
	5-1.C: Adopt a landscape ordinance for new development, consistent with Department of Water Resources guidance.			
	5-2.B: Develop an outreach program to educate residents and business owners on ways to minimize wastewater generation and reuse techniques.			

## Waste Diversion and Reduction Action Area (WR)

### 6-1: Waste Reduction Policies

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>6-1.A:</b> Establish a 2020 waste reduction target of 75% below 2005 levels and work with the County, neighboring cities and other organizations to create a low-waste plan and provide public education regarding low-waste strategies and implementation.	This measure assumes a 75% reduction in landfill waste by 2020. The baseline waste generation rate from 2005 was projected for 2020. This measure would apply to GHG emissions associated with new waste only and would not apply to waste in place.			
	75% waste diversion rate by 2020	N/A	18,880 MT CO <sub>2</sub> e/yr in 2020	Sacramento County. 2009. Greenhouse Gas Emissions Inventory for Sacramento County.
<b>Supporting Measures</b>	6-1.B: Increase recycling and composting programs to divert waste from landfills.			

## Green Infrastructure, Public Health and Safety

### 7-1: Urban Forestry

Measure	Performance	Participation Rate	GHG Reduction (MT CO <sub>2</sub> e/year)	Sources
<b>7-1.A:</b> Enhance the City's urban forest and other green infrastructure to reduce building energy use, improve comfort, augment neighborhood aesthetics, improve stormwater quality, and maximize carbon capture and storage.	This measure is based on extrapolating the carbon sequestration potential of a typical tree palette across the public tree planting goals (5,000 trees planted on public land within rights-of-way in the City by 2020). Carbon sequestration rates specific to the species and age of the planted trees were used to calculate the annual sequestration potential of the trees from 2010 to 2020.			
	N/A	1,500 trees by 2020	110 MT CO <sub>2</sub> e/yr (building energy savings)  630 MT CO <sub>2</sub> e/yr (carbon capture and storage)	<i>The Center for Urban Forest Research Tree Carbon Calculator.</i> <i>California Energy Commission [CEC] 2005. Electricity Usage During Peak Periods.</i> <i>California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings</i>

## Statewide Greenhouse Gas Emission Reductions

### Assembly Bill 1493 (Pavley)

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, was signed into law in 2002. The GHG reductions associated with AB 1493 that would affect the City in 2020 were calculated using ARB's *Pavley I + Low Carbon Fuel Standard Postprocessor* Version 1.0 (ARB 2010<sup>1</sup>). This model applies an approximate 15.76% reduction to light and medium duty vehicle on-road mobile-source GHG emissions for AB 1493 in 2020 (ARB 2010).

Transportation Sector Emissions	Regulated Performance Improvement in 2020	Emission Reductions (MT CO <sub>2</sub> e/year)
248,963	15.76%	39,240

Sources of information:

ARB. 2010. *Pavley I and Low Carbon Fuel Standard Postprocessor* Version 1.0. Available: <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

### Low Carbon Fuel Standard

The Low Carbon Fuel Standard (LCFS) is a program developed to reduce the carbon intensity of fuels used within California. In addition, the LCFS is designed to accelerate the availability and diversity of low-carbon fuels. The ARB's *Pavley I + Low Carbon Fuel Standard Postprocessor* Version 1.0 was used to quantify the GHG reductions from LCFS that would apply to the City in 2020. This model applies an approximate 10.0% reduction to on-road mobile-source GHG emissions for LCFS in 2020 (ARB 2010).

<sup>1</sup> Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. Available: <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

Total 2020 Transportation Sector Emissions	2020 Transportation Sector Emissions minus AB 1493	Regulated Performance Improvement in 2020	Emissions Reductions (MT CO <sub>2</sub> e/year)
248,963	209,723	10.0%	<b>20,970</b>

Sources of information:

ARB. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. Available at <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

Notes:

<sup>1</sup> Transportation emissions shown represent the total 2020 transportation emissions after reductions associated with AB 1493 have been achieved. This method was used to avoid double counting and overestimating GHG reductions associated with statewide actions.

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